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No. 22.

AGGLUTINATION AFTER THE ADMINISTRATION OF
TYPHOID AND PARA-TYPHOID VACCINES.
A Thesis presented for the degree of Doctor of Medicine.

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Force, and Demonstrator in Pathology,
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(Continued from page 438.)

Dosage.

Wright (1904) (*loc. cit.*) originally used large doses, 750 to 1,000 millions for the first injection and 1,500 to 2,000 millions for the second injection. Citron (1912) (29) states that he has used these large doses on an extensive scale, without any ill-effect.

The objection raised to these large doses is that the general reaction that follows is too severe. The usual dosage nowadays is 500 millions for the first injection, 1,000 millions for the second, and, if a third injection is given, the 1,000 millions dose is repeated. The interval between the doses varies from seven to ten days. Probably ten days' interval, as advocated by Leishman, is the most satisfactory.

In the Australian Army, until recently, the method of dosage was somewhat haphazard. In some cases two injections were given, in others more. The dosage varied, as also did the interval between the doses. However, a uniform method of procedure has now been adopted, the dosage employed being 250 millions for the first dose, and, seven days later, 500 or 1,000 millions, according to the reaction following the first dose. Perhaps this interval is rather short, but the fact that the men have to come up for reinoculation on the same day the following week is a great practical advantage.

Effects of Dosage on the Development of Agglutinins.

Neisser and Lubowski (1906) (30), working with rabbits, found that a strict parallelism between the amount of bacilli injected and the agglutinating value produced thereby does not exist. Many animals with smaller doses exhibited higher agglutinin values than other animals with larger doses.

Wright (1908) (31) states that there is not, as is clearly shown in connexion with preventive inoculation against typhoid fever, any constancy in the immunizing response of healthy men to one and the same dose of one and the same vaccine.

Leishman and Harrison (1905) (*loc. cit.*) carried out investigations on four groups of soldiers, each group receiving different dosage. Dealing with the effects of dosage upon the development of protective substances, they found that the quantity developed bears a general relation to the quantity of vaccine employed. This general relationship does not, however, appear to be in proportion to the differences in dosage; for instance, the values in Group B were only slightly lower than those recorded in Group A, although A received twice as much vaccine as B. And again, the quantity of protective substances developed in Group C, which received but one-sixth of the dose

given to A, was remarkably high considering the small dose employed.

Dreyer and Inman (1905) (*loc. cit.*) found that persons who received two doses of vaccine usually, but not always, exhibited a higher agglutinin titre than those who had only one dose. They state, further, that, although the titre of the serum in persons who had not been inoculated before, and only received a single dose of vaccine, may, in some instances, at first be as high as, or even higher than that of those who received two doses, it was found that, after a certain lapse of time, it falls to a lower level than in the latter individuals.

Author's Experiments.—Throughout my investigations a conspicuous feature was the great variation in agglutinin response shown by different individuals to exactly the same doses of the same vaccine. In view of this great variation in susceptibility, it is impossible to form definite conclusions from the few cases examined in detail.

It would, however, seem that after a single injection especially of 500 million bacilli the agglutination titre may rise to just as high a level as when several injections have been given. As to whether it is the rule for the titre in the latter cases to be maintained at a higher level than in the former, as Dreyer and Inman contend, there is not enough evidence to justify a conclusion being drawn. In certain individuals, at least, it would appear that this is not the case. On the whole, the curves resulting from single injections closely resemble those found after two or more doses have been administered.

Two injections in some individuals seem to be as effective as three injections in others, not only as regards the height to which the agglutination titre rises, but also as regards the persistence of the titre at a comparatively high level. In Table VI., for instance, the titre, ninety-six days after the first inoculation, is lower in the individual who received three injections than in those who received only two doses.

As a rule, the larger the dose employed the greater the agglutinin response. Usually, a single injection of 250 millions stimulates less agglutinin production than does the injection of 500 millions.

It seems probable that if a 250 million dose has once been given, a larger dose, for example, 500 millions, given subsequently has less effect in stimulating agglutinin production than if it were given in the first instance. It is also probable that two injections of 250 millions, as in Case 81 (Table XVII.), stimulate less agglutinin production than a single dose of 500 millions.

These last two statements are to be regarded merely as suggestions.

Effects of Subsequent Doses on the Agglutinin Forming Mechanism brought into Existence by the First Dose.

Wright (1904) (*loc. cit.*) states that, after inoculation, the organism seems to possess during the positive phase—and it would seem even afterwards—a greater power of response to a renewal of the vac-

inating stimulus. Moreover, he states, cumulation may take place in two opposite directions. When, in the case of two successive inoculations, the second falls upon the positive phase of the former inoculation, or, as the case may be, on any period when the blood contains an increased quantity of antitropic substances, there is developed a cumulative high tide of immunity. When, on the contrary, the second inoculation falls on the negative phase of the first, cumulation takes place in the direction of the negative phase. There is developed then a condition of cumulative susceptibility.

Von Dungern (1903) (32) carried out experiments on rabbits inoculated with crab's blood. These showed that, even after the specific antisubstances which have been produced by inoculation, have disappeared from the blood, the inoculated animals retain a power of responding to a renewal of the vaccinating stimulus.

Leishman and Harrison (1905) (*loc. cit.*) found that, in three of the four groups of men they tested, re-inoculation appeared to stimulate rather than retard further elaboration of protective substances. In these groups the interval between inoculation and reinoculation was eleven days. The fourth group consisted of men who had been inoculated with typhoid vaccine five years previously. On being reinoculated, each was given a very small dose (17 millions), with a view to testing the supposed power in such cases of an increased response to inoculation in the elaboration of protective substances. No marked result, however, followed, so a tenfold dose (170 millions) was administered, but even then no unusual development of protective substances occurred. They considered that, probably, the interval of five years which had elapsed since the former inoculation was too great.

Dreyer and Inman (1915) (*loc. cit.*) found that, after typhoid inoculation in persons who had been inoculated before (within six years), the agglutinin titre maintained a high level for a longer period than in the case of those not previously inoculated. The importance of repeated inoculation is, therefore, clearly not so much that it induces of necessity a high initial immunity, but that it ensures a more persistent one.

Author's Experiments.—Throughout my investigations occasional cases were met with in which a previous inoculation with typhoid vaccine had been given. Re-inoculation was then found to stimulate less agglutinin production, in the early stages at least, than was stimulated by the same dose in uninoculated individuals.

No. 44 (Table IV.) stands in marked contrast to the other cases in this series. Though exactly the same treatment was employed in all cases, the agglutinin response in this instance was very feeble.

No. 77 (Table XI.) also showed a less marked response than the uninoculated individual who received similar treatment.

No. 82 (Table XIII.) is somewhat different, in that re-inoculation was made with paratyphoid and not typhoid vaccine; but it is interesting to note the absolute failure to respond, whereas the uninoculated control responded in a marked degree.

Table III. shows the effect of re-inoculation with double the original dose fourteen days after the first injection. In only two out of eight cases was a rise in titre observed after re-inoculation. Even in those two the additional rise may have been due, not to the second injection, but to the lapse of time, for, though the maximum titre is usually attained within fourteen days after the first inoculation, occasionally a slightly longer period is necessary.

Table XVI.

Table XVI. shows the effect of re-inoculation with the same dose about two months after the original inoculation. In these three cases the serum was tested immediately before and fourteen days after the first inoculation, immediately before and fifteen days after the second inoculation. The difference in response is quite evident, and may be seen graphically represented in Charts VII., VIII. and IX.

Tables III. and XVI. suggest that, where a series of inoculations is employed, the first injection is the main factor in stimulating the development of agglutinins, subsequent injections having comparatively little effect in this direction. In no case was it found that re-inoculation caused a fall in titre.

Tables XVII. and XVIII. contain the results of tests that were carried out with the idea of further investigating this theory.

Table XXI.

All these persons, with two exceptions, had previously received typhoid inoculations varying from one to three in number, and from 250 to 1,000 million bacilli in amount.

The two exceptions were No. 83, who had been inoculated with paratyphoid, but not typhoid vaccine, and No. 85, who was a non-immune control.

It is interesting to note that in No. 83 the typhoid agglutinins already present as a result of the para-

Table XVI.—*B. typhosus* vaccine II. *B. typhosus* emulsion II.

Number	Age in Years.	Weight in Pounds.	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions
75	21	147	6.11.'16	+ 1 in 10 90 secs.	500	20.11.'16	+ 1 in 5,000 90 secs.	Nil	17.1.'17	+ 1 in 1,000 50 secs.	500	12.1.'17	+ 1 in 2,000 50 secs.	Nil
76	21	150	6.11.'16	—	250	20.11.'16	+ 1 in 5,000 60 secs.	Nil	17.1.'17	+ 1 in 100 50 secs.	250	12.1.'17	+ 1 in 500 100 secs.	Nil
81	22	154	21.11.'16	—	250	4.12.'16	+ 1 in 2,000 100 secs.	Nil	17.1.'17	+ 1 in 200 80 secs.	250	12.1.'17	+ 1 in 200 60 secs.	Nil

typhoid inoculation were not increased in amount by the subsequent injection of typhoid vaccine. The comparatively marked response on the part of No. 85, the uninoculated control, presents a definite contrast to the feeble response shown by all the previously inoculated individuals, with the exception of No. 75, who, on account of the large dose he received, really does not come into this category.

have no influence on the clinical effect produced by the vaccine. As a general rule, the local reaction varied directly with the constitutional symptoms. It was exceptional for a man to show marked constitutional symptoms and at the same time a mild local reaction, and *vice versa*.

Usually the clinical reaction varied with the dose, the larger the dose the more marked the clinical effect,

Table XVII.—B. typhosus vaccine II. B. typhosus emulsion III.

Number	Age in Years.	Weight in Pounds.	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions	Date.	Agglutination.	Dose in Millions
73	21	135	17.1.17	+ 1 in 100 50 secs.	250	25.1.17	+ 1 in 200 50 secs.	Nil	1.2.17	+ 1 in 200 40 secs.	Nil	7.2.17	+ 1 in 200 40 secs. (marked)	Nil
74	22	139	22.1.17	+ 1 in 100 70 secs.	250	25.1.17	+ 1 in 50 60 secs.	Nil	1.2.17	+ 1 in 100 100 secs.	Nil	7.2.17	+ 1 in 100 120 secs. (trace)	Nil
75	21	147	17.1.17	+ 1 in 200 70 secs.	500	25.1.17	+ 1 in 200 50 secs.	Nil	1.2.17	+ 1 in 500 50 secs.	Nil	7.2.17	+ 1 in 500 80 secs.	Nil
76	21	150	17.1.17	+ 1 in 50 50 secs.	250	25.1.17	+ 1 in 200 80 secs.	Nil	1.2.17	+ 1 in 200 120 secs. (trace)	Nil	7.2.17	+ 1 in 100 120 secs. (trace)	Nil
81	22	154	17.1.17	+ 1 in 20 60 secs.	250	24.1.17	+ 1 in 100 70 secs.	Nil	1.2.17	+ 1 in 100 50 secs.	Nil	7.2.17	+ 1 in 100 70 secs.	Nil
83	22	152	22.1.17	+ 1 in 200 70 secs.	250	—	—	—	—	—	—	7.2.17	+ 1 in 200 50 secs.	Nil
85	44	136	24.1.17	—	250	2.2.17	+ 1 in 200 120 secs. (trace)	Nil	5.2.17	+ 1 in 200 50 secs. (marked)	Nil	8.2.17	+ 1 in 200 50 secs.	Nil

Table XVIII.

Table XVIII. contains the results of tests that were performed with the object of emphasizing, if possible, the difference in agglutinin response after first and after subsequent inoculations. The results speak for themselves. As the dose employed was larger than in Table XVII., so the agglutinin response in uninoculated individuals was greater. In the previously inoculated cases, however, the rise in titre was absent or very slight.

both local and general. In the 5,000 men inoculated at Bathurst it was observed that, after the doses were increased from 250 and 500 millions to 500 and 1,000 millions, there were appreciably larger numbers on sick parades with symptoms like those of influenza, and with temperatures ranging from 38.3° to 39.4° C.. Probably the malaise and feverishness were direct results of the inoculation; possibly in some cases the inoculation lowered their resisting power and predisposed to colds, influenza, etc.

Table XVIII.—B. typhosus vaccine II. B. typhosus emulsion III.

Number.	Age in Years.	Weight in Pounds.	Date.	Agglutination.	Dose in Millions.	Date.	Agglutination.	Dose in Millions.
73	21	135	14.2.17	+ 1 in 500 90 secs.	500	26.2.17	+ 1 in 500 40 secs.	Nil
74	22	139	14.2.17	+ 1 in 100 120 secs. (trace)	500	26.2.17	+ 1 in 200 100 secs.	Nil
76	21	150	14.2.17	+ 1 in 100 120 secs. (trace)	500	26.2.17	+ 1 in 200 80 secs.	Nil
81	22	154	14.2.17	+ 1 in 200 110 secs.	500	26.2.17	+ 1 in 200 120 secs. (trace)	Nil
86	23	140	14.2.17	—	500	26.2.17	+ 1 in 2,000 30 secs.	Nil
87	28	144	14.2.17	—	500	26.2.17	+ 1 in 2,000 30 secs.	Nil
88	22	132	14.2.17	—	500	26.2.17	+ 1 in 1,000 30 secs.	Nil
89	20	161	14.2.17	—	500	26.2.17	+ 1 in 1,000 30 secs.	Nil

Influence of Dosage on the Clinical Effects Produced by Inoculation.

In most cases the first inoculation was the more severe, in a few the second injection caused the greater disturbance. Body weight of the patient seemed to

Unusual Clinical Results Following Inoculation.

In the case of one man, who received doses of 500 and 1,000 millions, the temperature rose to 39.4° on each occasion, and he had to be kept in hospital for some days after each injection. In only one case

did an abscess form at the site of inoculation. Probably this was due to inadequate aseptic precautions when administering the vaccine. One man, who used to suffer from rheumatism, but had been free from trouble for some time, complained of pain in the joints that used to be affected. This return of joint trouble, however, was only temporary. In no case, with this possible exception, was it found that the inoculations lit up latent chronic foci.

Acknowledgements.

In conclusion, I desire to acknowledge my indebtedness to Professor D. R. Welsh, in whose laboratory part of the work was conducted, for his advice and assistance on frequent occasions, to Doctor Oliver Latham, for his help with the emulsions, to Doctor E. A. Buckley, for providing the paratyphoid cultures; and, finally, to the many willing victims who so kindly offered themselves as lambs for the slaughter.

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AN EXPERIENCE OF FIFTY CASES OF RECTAL ETHER ANÆSTHESIA.

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During the last six months fifty cases have been operated upon in this hospital with the above method of anæsthesia. Whilst the number is small, the nature of the operations have been varied, and sufficient experience has been gained to convince me of the value of the method in suitable cases. I therefore make no apology in reporting such a small number, and do so in the hope that the report of my experience may stimulate a wider use of a method of anæsthesia which up to the present, though gaining ground, is not largely used.

To the medical man in the country, who has to perform emergency operations without an assistant, the method would probably be of most value, and I do not hesitate to advise him to use it. Provided a proper technique of administering is adopted, and a suitable dose given, the method is, I think, as safe or even safer than the usual inhalation methods.

It would almost seem that it is impossible for absorption to take place rapidly enough to overdose the patient, provided, of course, that a recognized safe amount is given. Further, it would appear that a constant automatic regulation is going on between the rate of absorption from the rectum and the ether exhaled in breathing. In 20 out of the 50 cases the balance has been on the side of too rapid exhalation, or too slow absorption, and this has been checked by placing a towel or layers of gauze over the mouth and nose, causing rebreathing of the exhaled ether, or by administering a few drops of chloroform on a mask. In only one case did the anæsthesia seem too deep. Thirty cubic centimetres of the mixture were withdrawn through a rectal tube and the operation proceeded without any trouble arising. One cannot, of course, speak dogmatically on the safety phase of the method with so few cases as a guide; but amongst my cases were some lengthy operations and some very poor anæsthetic risks, yet in no case, except in the one above mentioned, was there the slightest anxiety about the patient's condition. On the contrary, the general well-being of the patients and the natural sleep-like condition in which they lie, give one a feeling of perfect confidence.

Apparatus Required.

No special apparatus is needed. All that is used is a No. 10 rubber catheter attached by glass connexion to about a metre of rubber tubing into the end of which is inserted a glass funnel, or better still a small cylindrical glass vessel about twice the size of an ordinary test tube.

Dosage.

Preliminary medication. Twenty minutes before the ether mixture is given a mixture of 3.5 c.cm. ether and 7 c.cm. of olive oil, in which are dissolved 0.6 grm. of chloretone, is administered through the funnel and catheter. The ether is added to dissolve the chloretone, which in itself acts as a hypnotic and local anæsthetic. The oil is employed as a diluent of the ether. At the same time a hypodermic injection containing morphine 0.01 grm., strychnine 0.0015 grm. and atropine 0.0004 grm. is given.

Rectal Anæsthetic Mixture. In adults a 75% solution of ether in olive oil is used for a full dose of 240 c.cm., 180 c.cm. of ether and 60 c.cm. of olive oil. The basis on which the dosage is calculated, is three cubic centimetres of this mixture to each kilogram of body weight, but no matter how heavy the patient be 240 c.cm. is not exceeded. I have not held closely to the three cubic centimetres to the kilogram in the last 25 or 30 cases, as the tendency has been, working on this basis, for the patients to be under rather than over anæsthetized, but with this basis to work on, the general condition and robustness of the patient is taken into account, and 200 c.cm. may be given where 180 c.cm. should have been the dose. My results have improved since adopting this plan. In no case has less than 3 c.cm. to each kilogram of body weight been given.

In children from three to sixteen years of age, a 50% mixture of oil and ether is given, with no preliminary chloretone medication. The dose is calculated in the same way as for adults, *viz.*, 3 c.cm. for each kilogram body weight.

Technique of Administration.

A soap and water enema is first given, followed by a saline rectal wash-out. The patient is then allowed to rest for a while. He is then turned on his side, the vaselined catheter inserted a few centimetres into the rectum, and the chloretone mixture slowly given. Twenty minutes later the anæsthetic mixture is administered. The patient is again turned on his side, care being taken not to raise the pelvis. This I regard as important for safety sake. It ensures that the ether lies in the lower part of the rectum and can there be rapidly withdrawn, if necessary. The catheter is inserted 10 to 15 cm. and the anæsthetic mixture given very slowly. Too rapidly administered the ether will cause pain and burning and consequent expulsion. Twenty-five minutes are occupied in giving a full dose of 240 c.cm. The two important details to attend to in the administration are: first, not to raise the pelvis, but on the contrary to endeavour to keep the mixture a few centimetres inside the sphincter; and second, to give the mixture very slowly. At the conclusion of the operation, the patient is turned on his side, a trivalve rectal speculum inserted, and the surplus oil and ether run out. The rectum is then washed out with saline solution.

Indications and Contraindications.

The method is applicable to all ages from three years upwards. It is of especial value in all operations upon the head and neck, largely because it eliminates the anæsthetist. I consider it to be the best of all methods for goitre operations, from both the patient's and surgeon's points of view. In toxic cases the element of fear can be almost, if not entirely, eliminated by rehearsing for a week or more before operation every detail of the technique of administration, using saline solution instead of the ether. The patient is given to understand that this daily rectal wash out forms part of the preliminary treatment. The day for operation is arranged, the relatives informed, but asked to keep away so as to cause no suspicion. At the usual time the usual nurse gives the real thing unknown to the patient. When he is going under and oblivious to what is going on, iodine preparation of the skin is carried out. Of three patients in a very toxic condition anæsthetized in this way, one had a suspicion that she was being anæsthetized. She said afterwards that she thought something was happening, as she tasted the ether in her mouth. They all expressed their surprise and pleasure on regaining consciousness to find their operation over. The results of this rehearsal method on the pulse-rate before starting and after operation are, I think, most convincing. (See Cases IV. and V.) I think it is entirely due to the elimination of that dangerous factor, fear.

From the operator's point of view, the method is ideal in head and neck cases. No anæsthetist is near to get in the way. No screen is required to cut him off in goitre cases, and sterile coverings are over everything, including the face, two or three layers of gauze being used for the latter. Should a few drops of chloroform or ether be required during operation they can be given on a sterilized mask held by an assistant, with a long forceps.

The method is also of special value when it is particularly desired that no vomiting should occur, as in cases of ventral and umbilical hernia. I use it as the method of choice in asthenic and bad risk cases, such as palliative gastro-jejunostomy in advanced pyloric cancer. I am convinced that this class of case stands the operation much better than if inhalation methods are used. The method should also be of special value for patients with pulmonary tuberculosis and other lung conditions where operation may be required, but I have not had an opportunity of trying it in such cases.

As regards children, I have had little experience, but would not use the method on patients under the age of three years, and then only for some special purpose such as an operation upon the skull. (See Case III.) The only contra-indications I can see to the method are: (1) Pathological conditions of the lower bowel; (2) children under three years; (3) in cases requiring operation in the Trendelenburg position the patients should not, I think, be anæsthetized in this way. The ether may find its way high up the colon, cover over a large absorptive area, and be too rapidly absorbed. The mixture would then also be beyond control, should a rapid withdrawal be necessary.

Induction Stage.

The average length of time elapsing between the commencement of the administration of the anæsthetic mixture and the start of operation lies between 25 and 60 minutes. This wide variation must, I think, depend a good deal on different rates of absorption from the bowel. The great majority of the patients pass into insensibility quietly and smoothly. They first become drowsy, gradually becoming unconscious, without any fuss or trouble of any kind. In all the cases careful and frequent records of the pulse and respiration, and in most cases of the blood pressure, also were taken, and one of the most noticeable features of the induction stage is the absence of any alteration in all three. One patient, with cerebral tumour, became very restless and violent during induction and had to be given a good deal of chloroform to quieten him. Three have been loquacious, and one, suffering from gastric carcinoma, retched a good deal, expelling a quantity of the anæsthetic mixture. Two patients complained of burning in the rectum, but not severe. One patient, a male, who was anæsthetized three times by this method, on each occasion complained of severe abdominal pain. One patient, a girl of 16 years, though not making any complaint, expelled the mixture as soon as it was given, but retained it without difficulty when a 50% mixture was substituted. One patient, not included in this series, a fat woman with a large umbilical hernia, refused after several attempts to retain the mixture, and had to be anæsthetized in the usual way. Several of the toxic goitre patients have been a little restless, as they were going off, but with the exceptions above mentioned, all the patients have behaved in the normal, quiet way.

If the induction be unduly prolonged, anæsthesia can be hastened by placing a towel over mouth and nostrils, causing rebreathing of the exhaled ether, or a few drops of chloroform or ether may be administered on a mask.

The majority of my patients have been helped in this way, but more from the point of view of saving time than from necessity. It is remarkable the small quantity of chloroform required to produce surgical anæsthesia in a patient who a moment before, though drowsy, would answer questions. From 10 to 30 drops of chloroform and in two or three minutes they are ready for operation and remain anæsthetized.

Anæsthetic Stage.

The anæsthesia from a surgical point of view has in a majority of the cases been satisfactory, and in many perfect. The patient resembles nothing so much as a person in a quiet sleep. The normal colour and pulse-rate is maintained. In abdominal cases one of the most noticeable features is the absence of the heaving, diaphragmatic breathing, so often seen when the open ether method is employed. My abdominal cases have not been many, and taking them altogether I have not been very impressed with the method in abdominal work. For certain specified cases mentioned above, the method is, however, of distinct value. As regards abdominal relaxation, I am not altogether satisfied. Some of the

cases have been perfect, some disappointing, but none bad.

In 20 of the cases there has been a tendency for the patient to be too lightly anæsthetized, and in 14 of these a few drops and in five a fair amount of chloroform, up to 30 c.cm., have been administered during the progress of the operation.

Corneal Reflex. In 35 of the cases a note was made of this; it was present in 17 and absent in 18. The more deeply the patient is under, the more sluggish is the reflex, but for head and neck operations in particular, perfect anæsthesia has been obtained with an active corneal reflex.

General Condition of the Patient During Operation.

Probably the most noticeable features of a case are the normal colour of the face and the quiet, natural breathing. The patient for all intents and purposes might be asleep. I have noticed in several cases where some signs of shock might be expected, that they were absent, and the blood pressure, pulse and respiration observations made several times during severe operations, failed to show any signs that the patient was feeling the strain. (See Cases I., II. and III.) In only one case was shock of any severity noticed. In this case it was directly the result of hæmorrhage from the cystic artery in a feeble old woman, aged 64, suffering from empyema of gall bladder, on whom a cholecystectomy was being performed.

Post-operative Period.

This throughout has been most satisfactory. No bad symptoms attributable to the anæsthetic have occurred. On the contrary there has invariably been a feeling of well-being a few hours after even lengthy operations, which is not often seen even after comparatively short operations under open ether. At the same time, careful watching of the patient is necessary till full consciousness is regained. In 24 of the cases there has been no vomiting, or even nausea; and this quite irrespective of the class of operation performed. In 25 of the patients who vomited the sickness did not last more than three or four hours, and the average number of times they have vomited has been four. In one case only was there slight sickness as late as twelve hours.

One patient complained rather severely of headache for 24 hours after the operation. In no instance was there any sign of rectal irritation, or rectal trouble of any kind. Several of the patients have retained continuous saline solution *per rectum* without any trouble, immediately on return to the ward.

The average time required for recovery of consciousness, *i.e.*, when the patient will speak rationally, has been two hours from the time the patient has returned to the ward.

The following operations have been performed:—
Head and Neck Cases. Partial thyroidectomy (19), cerebral decompression (1), sequestromy of skull (1), osteo-plastic resection of skull (1), removal of fibrous polyp from the naso-pharynx (1), excision epithelioma of the lip and dissection of the sub-

maxillary triangles (2), Williams' radical frontal sinus operation (1): total 26.

Abdominal Cases. Appendicectomy (3), for ventral hernia (2), gastro-jejunostomy (3), cholecyst-enterostomy (1), cholecystectomy (1), cholecystostomy (1), resection of the ascending and two-thirds of the transverse colon (1), for strangulated femoral hernia (1), abdominal exploration (3): total 16.

Miscellaneous Cases. Radical amputation of breast (3), for acute suppurative osteomyelitis of the femur (2), pyelo-lithotomy (1), excision of varicose veins (1), suture of divided nerves and muscles of the forearm (1): total 8. Grand total, 50.

The following five cases will serve to illustrate some of the points mentioned above. Careful note was taken in all cases of the exact time of administration, commencement and end of operation, etc.

Case I.—Illustrating Absence of Shock and Advantage Gained by No Vomiting.

Mrs. B., *act.* 39 years; weight, 49 kilograms; blood pressure, 104 mm. Large ventral hernia, the size of a football, in the mid-line of the lower part of the abdomen.

Pulse.	Respiration.	Procedure.
11.45 a.m...	64 .. 16	Rectal chloretone mixture; morphine (0.01), strychnine (0.0015) and atropine (0.0004).
12.5 p.m...	64 .. 16	Rectal anæsthetic mixture (75%), 180 c.cm.
12.45 p.m...		Induction prolonged; 15 drops of chloroform.
12.50 p.m...	80 .. 16	Blood pressure 104 mm.; operation commenced
2.35 p.m...	72 .. 14	Blood pressure 104 mm.; operation concluded.

The operation lasted 1½ hours. One hour was occupied in separating massive intestinal and parental adhesions, necessitating extensive handling of bowel. Abdominal relaxation was perfect. The depth of the anæsthesia was perfectly controlled by a towel over the face. Recovery was uneventful, and no vomiting or retching occurred.

Case II.—Again Illustrating Absence of Shock.

J. Y., male, *act.* 54 years, weight 57 kilograms, blood pressure 120 mm. Carcinoma of the hepatic flexure; resection of the ascending and two-thirds of the transverse colon and lateral anastomosis.

Pulse.	Respiration.	Procedure.
2.0 p.m...	72 .. 16	Rectal chloretone mixture; morphine (0.01), strychnine (0.0015) and atropine (0.0004).
2.20 p.m...	72 .. 18	Rectal anæsthetic mixture (75%) 210 c.cm.
3.20 p.m...	64 .. 16	Blood pressure 120 mm.; operation commenced
5.15 p.m...	96 .. 26	Blood pressure 115 mm.; operation concluded.

The induction was smooth and uneventful. The anæsthesia and abdominal relaxation were perfect. Recovery was uneventful. There was no vomiting or retching.

Case III.—Illustrating Absence of Shock in a Child.

G. F., male, *act.* 3 years 8 months; weight 14 kilograms. No blood pressure observations were made. Jacksonian epilepsy; osteo-plastic resection of the skull over the right motor area.

Pulse.	Respiration.	Procedure.
12.20 p.m...	100 .. 20	Morphine (0.0028), strychnine (0.0004) and atropine (0.00012). No rectal chloretone mixture given.
12.50 p.m...	100 .. 20	Rectal anæsthetic mixture (50%) 90 c.cm.

1.10 p.m... 110 .. 32 Operation commenced.
2.20 p.m... 112 .. 32 Operation concluded.

The anæsthesia was perfect. The child was lying all the time as if in a quiet sleep. Recovery was uneventful. Vomited twice after taking drinks.

Case IV.—Illustrating Value of Reversal Method in Toxic Goitre Cases.

Mrs P., *act.* 53 years; weight 55 kilograms; no blood pressure observations were taken; removal of one lobe and two-thirds of the other. This case was a very acute and extreme one. When the patient first entered the hospital the pulse-rate at rest varied between 130 and 150. The heart beat was irregular; she was wasted and was rapidly losing flesh. There was marked exophthalmos, and she could hardly speak on account of the tremor of the lower jaw. Five weeks previously both superior thyroid arteries had been ligated under rectal anæsthesia. A daily rehearsal of the method of anæsthesia had been practised up to the time of operation. The prognosis was bad, but as will be seen, the patient stood the operation unexpectedly well. Four days after operation the pulse-rate varied between 99 and 110.

Pulse.	Respiration.	Procedure.
10.15 a.m...	120 .. 26	Rectal chloretone mixture; morphine (0.01), strychnine (0.0015) and atropine (0.0004).
10.35 a.m...	120 .. 26	Rectal anæsthetic mixture (75%) 240 c.cm.
11.30 a.m...	130 .. 28	Operation commenced.
12.35 p.m...	132 .. 33	Operation concluded.

The anæsthesia was perfect. The patient recovered consciousness quietly and calmly without vomiting or nausea, and never gave the slightest anxiety during convalescence. The highest pulse-rate during the first 24 hours after operation was 140. Had this patient been operated upon by either local or general anæsthesia and the element of fear not removed, her pulse-rate at the start of operation would probably have been between 150 and 160. Her heart could never have stood the strain.

Case V.—Same as No. 4.

N. G., female, *act.* 19 years; weight 48 kilograms. No blood pressure observations were made. She had a toxic goitre, with severe symptoms for 12 months, with marked exophthalmos and nervousness, palpitation and a rapid heart's action. Her pulse-rate varied between 120 and 130 at rest. Removal of one lobe and two-thirds of the other. Thirteen days' rehearsal anæsthesia.

Pulse.	Respiration.	Procedure.
1.50 p.m...	120 .. 20	Rectal chloretone mixture; morphine (0.01), strychnine (0.0015) and atropine (0.0004).
2.10 p.m...	120 .. 20	Rectal anæsthetic mixture (75%) 230 c.cm.
3.15 p.m...	136 .. 32	Operation commenced.
4.25 p.m...	132 .. 32	Operation concluded.

The patient was somewhat restless during the latter part of the induction stage. The anæsthesia was perfect and recovery was uneventful. The highest pulse-rate reached after the operation was 146. She vomited once two hours after regaining consciousness. She expressed great pleasure and surprise on waking to find that the operation was over. She was dreading it, and had taken twelve months to make up her mind to have it done.

These few cases are not selected because they are exceptions, but because they bring out in a marked degree some of the points which I have mentioned. Except in the cases of four patients, who passed some of the anæsthetic during the operation, and of one who did not absorb the mixture, as almost the total quantity was withdrawn after the operation, my experience of the method has been uniformly satisfactory. All of these five patients required a good deal of either ether or chloroform during the operation to maintain surgical anæsthesia.

Reviews.

PHARMACOLOGY, THERAPEUTICS AND PREVENTIVE MEDICINE.

The eighth volume¹ of the Practical Medicine Series, which comprises ten volumes on the progress of medicine and surgery in 1917, is divided into two portions dealing with pharmacology and therapeutics and with preventive medicine. The 220 pages devoted to therapeutics are edited by Bernard Fantus, who has classified the subject matter under the headings of etiologic therapy, restorative therapy and symptom therapy. A little space is given to technique, toxicology and non-pharmacological therapeutics. In connexion with methods of administration, attention is directed to Larned's account of intravenous medication. "Just as the subcutaneous method is better than the oral, so the intravenous injection is better than the subcutaneous." The 65 pages allotted to etiologic therapy deal with anti-septics and germicides, protozoicides and anthelmintics. Chlorine preparations occupy the place of honour among antiseptics. The principles underlying the production of harmless irrigating fluids are stated by J. F. McClendon to be isotonicity with the tissues, neutral reaction and requisite antiseptic strength. Dakin's solution has a freezing point of -0.8°C , while blood freezes at -0.55°C ; Dakin's solution is therefore hypertonic. McClendon recommends a physiological mixture of salts containing sodium, potassium, magnesium and calcium combined with carbonates, chlorides, phosphates and sulphates. This isotonic solution is treated with chlorine gas until it contains between 0.45% and 0.5% of hypochlorite of sodium. Carbon dioxide is bubbled through the solution until suitable indicators show that the concentration of the hydrogen ion is that of distilled water. Such a fluid gives good results in the treatment of large wounds, and it exhibits no disadvantages, but no evidence is available to show whether these methods are worth the extra-trouble involved. In the section upon protozoicides, accounts of methods of administration have been mainly selected for abstraction. In connexion with the use of quinine for the destruction of the malarial parasite, it is suggested that the use of quinine should be intermittent. During periods of 60 hours the drug should be frequently and regularly given to maintain a sufficient concentration of quinine in the blood to destroy the plasmodia. The administration of quinine should then be stayed for five or six days to permit of the development of spores. The period of intermission should not exceed seven days, as this interval is the time of one cycle in the life-history. Protest is made against the practice of giving occasional doses of quinine during the period of intermission, as this leads to further formation of spores. A good account of the film treatment of burns opens the section upon restorative therapy. This account includes description of the different paraffin mixtures, and of their preparation and of the mode of application. Acidosis and the exhibition of alkalis receive much attention. It is claimed that the administration of massive doses of sodium bicarbonate limits the excretion of glucose as well as of organic acids.

The selection of material for the section of therapeutics has been made with much judgement. The editorial comments are judicious. The practical use of drugs receives much attention, and the editor is to be congratulated on laying such stress on the detailed technique of the preparation of the patient and the dosage in its widest sense. This book can be recommended to general practitioners as a readable and interesting summary of recent therapeutic progress.

The section upon preventive medicine comprises 150 pages edited by W. A. Evans. It is divided into eight sections dealing with the relation of the physician to public health, general sanitation, personal hygiene, climate and health, inspection of school children, infectious and contagious diseases, occupational diseases and military hygiene. A good account of what has been ascertained concerning anterior poliomyelitis is included. The section on

occupational diseases deals not only with the well-known ailments due to the nature of the daily work, but discusses many forms of preventible ill-health due to carelessness while at work. The prevention of fatigue is considered in relation to the maximal rate of production. Much material obtained by the British Committee on the Health of Munition Workers is summarized. This section equals in interest that dealing with therapeutics.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending May 11, 1918:—

	Metropolitan District.		Hunter River District.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever ..	9	0	2	0	6	0	17	0
Scarlatina ..	21	0	0	0	13	0	34	0
Diphtheria ..	97	0	5	1	60	4	162	5
*Pul. Tuberculosis	16	10	0	0	2	2	18	12
C'bro-spinal Menin.	0	0	0	0	1	0	1	0
Poliomyelitis ..	1	0	0	0	0	0	1	0
Malaria ..	1	0	0	0	0	0	1	0

* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending May 12, 1918:—

	Metropolitan.		Rest of State.		Total.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever ..	3	0	4	0	7	0
Scarlatina ..	33	0	29	0	62	0
Diphtheria ..	112	4	83	2	195	6
Pulmonary Tuberculosis	22	7	8	3	30	10
C'bro-spinal Meningitis	1	—	0	—	1	—
Poliomyelitis ..	2	—	5	—	7	—

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending May 11, 1918:—

Disease.	No. of Cases.
Enteric Fever ..	5
Scarlatina ..	8
Diphtheria ..	53
Pulmonary Tuberculosis	10
Cerebro-spinal Meningitis	4
Erysipelas ..	1
Ancylostomiasis ..	1
Malaria ..	6

SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, during the week ending May 11, 1918:—

	Adelaide.		Rest of State.		Totals.	
	Cs.	Dths.	Cs.	Dths.	Cs.	Dths.
Enteric Fever ..	0	0	4	0	4	0
Scarlatina ..	0	0	9	0	9	0
Diphtheria ..	4	0	21	2	25	2
Pulmonary Tuberculosis	1	2	5	3	6	5
Erysipelas ..	1	0	3	0	4	0
Morbili ..	0	0	1	0	1	0

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the fortnight ending May 11, 1918:—

Disease.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Enteric Fever	2	0	7	9
Scarlatina	0	0	2	2
Diphtheria	1	16	28	45
Pulmonary Tuberculosis	2	3	5	10

¹ The Practical Medicine Series, under the general editorial charge of Charles L. Mix, A.M., M.D.; Volume VIII., Pharmacology and Therapeutics, edited by Bernard Fantus, M.S., M.D., and Preventive Medicine, edited by Wm. A. Evans, M.S., M.D., LL.D., P.H.D.; 1917 Series. Chicago: The Year Book Publishers, Melbourne: Stirling & Co. Crown 8vo., pp. 384, illustrated. Price, 7s.

The Medical Journal of Australia.

SATURDAY, JUNE 1, 1918.

Wasted Opportunity.

Last week we published a short account of a discussion on pathology in war-time. Dr. Tebbutt, a bacteriologist of experience, like many others trained to work in the laboratory, joined the Australian Imperial Force as a member of the Army Medical Corps, and served at the front as an Army surgeon. His special qualifications naturally impelled him to refer to the subjects around which his chief interests are wrapped, rather than to the surgical work to which he was required to apply himself. He points out that the story of Gallipoli might have been a very different one, had the Australian Army Medical Service included an adequately staffed and well equipped pathological branch. Later when a large Australian force was transferred to Flanders and France, the same conditions obtained and no provision was made for bacteriological or pathological work within our own service. Dr. Stacy speaks of the excellent work carried out in the pathological laboratories, not of the Australian Army Medical Corps, but of the Canadian Army Medical Corps. The Royal Army Medical Corps was also requisitioned for the purpose of applying the sharpest diagnostic instruments. In this way disaster was prevented from happening, but not by any action of our own. The greater part of Dr. Tebbutt's engrossing remarks was taken up with a summarized account of one piece of laboratory investigation by the pathologists in England. We look in vain for any organized work in the Commonwealth having for its object the elucidation of prob-

lems of medicine in connexion with the war. In the old country every effort is being co-ordinated and every available man set to some task for which he is fitted, in order that British troops shall have the best possible chance of serving for the Empire. The time has gone by when an Army can afford to face a foe, accompanied merely by surgeons to operate or apply splints, and syphilologists to treat the unfortunate evidence of civilization—venereal disease. The Army Medical Service of to-day is incomplete unless it embraces several well defined and specially equipped branches.

This is by no means the first time that this subject has been dealt with in these columns. Notwithstanding the fact that the defects in our medical service were well known to everyone, no attempt has been made to follow the lead of all the belligerent countries. We remain the only country at war from which an Army Medical Service has been sent, planned and arranged according to an antiquated principle. It is useless to enquire why nothing has been done to develop an orthopædic service, a neurological service, a pathological service and other special departments, in addition to the main body of the Army Medical Corps and the one essential branch for the treatment of venereal diseases. This cannot be explained on the ground that men trained in these special branches of medicine are not available. In the branch with which we are concerned for the moment Australia can put forward a sufficient number of men to meet the needs of our forces. More than that. Had there been a pathological branch, the services of Mathison, an expert of unusual ability, would in all probability still be available. Many men of ability have offered themselves as bacteriologists, but they received the reply that their services could not be accepted save for ordinary army medical work. It is late to remedy this defect; but there are indications that it is not too late. There are men serving at the front at the present moment whose training in the laboratory would render them eminently useful in mobile laboratories. Others can be had for the asking within the Commonwealth. Experience has impelled several trained pathologists to refrain from offering their services, because they recognized that they were unsuited for the work they would be re-

quired to do. But if these men could receive commissions as pathologists or bacteriologists, they would be prepared to undertake service to-morrow.

It is vain to urge the second step in the war service until this primary duty has been fulfilled. As soon as there are indications of a realization of our demands for a properly organized pathological branch of the Australian Army Medical Corps, it will be necessary to remind the authorities that the country is at war and that the combined efforts of all those trained in the laboratory should be employed for the furtherance of the study of some of the problems in war surgery and medicine.

THE ENCOURAGEMENT OF RESEARCH.

In last week's issue it was pointed out that the health of the community needs greater safeguarding than it obtains at present and that a considerable extension of the collaboration between the public health authorities and the general practitioner is necessary. The medical profession has a further obligation to the public. The amount of knowledge possessed at the present time is not sufficient for the purpose of controlling diseases effectually. Each member on entering the medical profession should recognize that the training accorded at the medical schools imposes upon him a duty to utilize his knowledge for the benefit of the individual patients who place their trust in him, and also of the whole community. At times the teachers at the Universities apparently forget that they should teach their students in addition to the practical side of medical science, how to use their powers of observation and of criticism for the purpose of advancing knowledge. The importance of this part of the training of a medical student is certainly not less than that of guiding him through his examinations. Every professor and every demonstrator should be capable of conducting original research and of imparting to others the knowledge required for this work. Research, whether conducted in the laboratory or at the bedside, means a power of observation, the exercise of ingenious interpretation of observed facts and phenomena and the recog-

nition of the value of experiment. "Don't think. Try!" has now become proverbial in science. To those who have not given careful consideration of the value of research to the world, we can commend the masterly address delivered by Professor H. G. Chapman to the annual meeting of the Linnean Society of New South Wales in March of this year. His tribute to Dr. C. J. Martin, as a man, not only capable of accurate and minute observation, but also endowed with the facility for imparting this power to others, is most excellent. If the number of competent research workers in Australia is small, the fault must be laid at the door of the teachers and not of the students. The average student will, no doubt, be tempted to select the practice of medicine without specialty as the most desirable branch for him to adopt, because it is immediately remunerative and does not entail any additional training. He should be guided by his teacher, and encouraged to sacrifice time, energy and financial considerations in the interests of his profession and of science. The selection of teachers of medical students should be undertaken with care, since the development of medicine in the succeeding generation of practitioners depends on the capabilities of the teachers. A man whose knowledge is derived solely from the published writings of original investigators, will never inspire a spirit of research among his pupils. Too little attention has been given to this quality in teachers in the past. Australia has allowed C. J. Martin and Almroth Wright to leave her Universities and to occupy positions in the old country. She has never made a greater mistake. In March of this year we advocated the establishment of a chair of pathology at the Adelaide University. The need for this is undoubted, but we would urge that the Senate should exercise discrimination in the selection of the professor and of his demonstrators and assistants, and refuse to appoint anyone who is not versed in the art of teaching students how to carry out original investigations. The opportunity for improving the standard of training and of knowledge is present. We look to the Senate for an indication of wisdom and of a desire to enable the graduates of the Adelaide University to command a prominent place in the world of medical science.

THE REACTIVITY OF THE TISSUES OF THE BODY.

The reaction of blood and of the tissues to acids and alkalis has been studied since chemists devised volumetric methods for estimating the acidity or alkalinity of different materials. While it was found comparatively easy to determine the amount of acid that could be neutralized by a given weight of blood or tissue, it was observed that the blood or tissue behaved in many ways differently to an aqueous solution of similar alkalinity. Much later, it was recognized that body fluids could neutralize alkalis as well as acids, and that methods of titration did not yield satisfactory figures for expressing the degree of acidity of these fluids. It became gradually known that these fluids, on the addition of acid or alkali, behaved quite differently to water. If a small amount of acid, sufficient to make a thousandth normal solution, be added to distilled water, the solution exhibits the qualities of an acid of this strength. If a small amount of soda, sufficient to make a thousandth normal solution, be added to a similar quantity of distilled water, a solution with the characters of an alkaline solution of this strength is obtained. To convert the acid solution to an alkaline solution of the same strength it is only needful to add twice the amount of alkali which must be added to the distilled water, to render it a thousandth normal alkali. The addition of quite small quantities of acid or alkali to distilled water thus confer on the solution the definite qualities of an acid or a base. With body fluids the conditions are different. A much greater amount of acid must be added before the fluid acquires the qualities of an acid or an alkali. As a rule quantities of acid sufficient to make a solution in distilled water of the strength of a twentieth normal are needed to give such fluids an acid reaction and to endow the fluid with the qualities of an acid. A quantity of alkali, sufficient to make distilled water of the strength of a fiftieth normal, is needed to make the same fluid exhibit alkaline properties. It is evident that body fluids are able to react with acids and alkalis, while maintaining the characters of a neutral liquid. Minute amounts of acid or alkali render water acid or alkaline, and the reaction can be changed by the addition of a small quantity of base or acid. The tissues of the body are capable of reacting with much acid or alkali before exhibiting definite acid or basic qualities, and a large addition of acid or alkali is needed to change the properties in either direction.

When biochemists became aware of these facts, attempts were made to measure the reactivity of the blood by titrating it with the aid of indicators sensitive to acids and with others sensitive to alkalis. The reaction of the fluids was also examined by comparing the behaviour of the fluids with that of acid solutions of known concentration. In this way the various methods for determining the hydrogen ion concentration of these fluids became established. It was thus possible to say that the fluids possessed the same acidic or basic qualities of a solution of

acid or base of definite concentration. Different fluids, however, require the addition of different amounts of acid or base to change the hydrogen ion concentration a definite amount. In consequence a knowledge of the reactivity and of the hydrogen ion concentration does not supply complete information of the behaviour of the fluid on the addition of more acid or alkali.

The titration of a sample of blood with acid and alkali and the measurement of its hydrogen ion concentration does not supply sufficient information to determine the degree of acidosis. Attempts have been made to measure the equilibrium point of acid and alkali in the blood in other ways. The tension of carbon dioxide in the alveolar expired air, and the amount of carbon dioxide held by a given volume of blood, have been used. The percentage of carbon dioxide in the alveolar expired air is dependent on the tension of the gas in the arterial blood leaving the lungs. It is asserted that the factor in the blood regulating the action of the respiratory centre in controlling pulmonary ventilation is hydrogen ion concentration. The hydrogen ion concentration is dependent on the tension of carbon dioxide (carbonic acid) and on the amount of acid present in the blood. In acidosis, with an increased amount of inorganic or organic acid in the blood, there is less carbonic acid present, and the percentage of carbon dioxide in the alveolar expired air is less. In conditions in which the bases are increased in the blood the carbonic acid is greater, and the alveolar percentage of carbon dioxide is augmented. The estimation of the total amount of carbon dioxide liberated from blood has been carried out by van Slyke. It has been demonstrated that the amount that can be freed from a given quantity of blood varies proportionately with the available base of the blood.

Recently, Yandell Henderson and H. W. Haggard have made some studies on this question.¹ They do not question the accuracy of these conceptions in the condition of true acidosis, but they attempt to show that, in many conditions simulating acidosis, another factor exerting influence on the amount of carbon dioxide in the blood is introduced. They find, for example, after the administration of morphine, that the content of carbon dioxide in the blood is raised. This condition soon leads to the passage of basic salts into the blood from the tissues, and to an increase in the capacity of the blood to take up carbon dioxide. Thus, the blood shows an increased alkaline reaction if measured by the carbon-dioxide capacity. The total alkali in the body remains the same, but it is distributed in a different manner. In other conditions an increased ventilation of the lungs may diminish the tension of carbon dioxide in the blood. The capacity of the blood to take up carbonic acid lessens by the passage of alkali from the blood to the tissues. The blood appears to be more acid, but the total alkali in the body remains unaltered. It is merely distributed differently between the blood and tissues.

¹ *Journ. Biol. Chem.*, Vol. XXXIII., p. 333, February, 1918.

It would appear from these investigations that the carbon dioxide capacity of the blood can be altered by other conditions than changes in acidic and basic equilibrium. Care should therefore be used in drawing inferences as to the acidity of the blood from estimations of the amount of carbon dioxide liberated from a definite volume of blood.

DYSENTERY AGGLUTINATION.

The war has furnished unique opportunities for the investigation of pathological and serological problems, but at the same time its attendant circumstances have complicated these problems by the confusion of types of micro-organisms producing the several diseases and by the modification of reactions resulting from artificial immunizations. Gradually a clearer understanding is being attained of the diversity of phenomena as strains of bacteria true to type have been differentiated one from another. It is still extremely difficult to follow the essential changes in the antibody production resulting from multiple immunizations. Until it has become possible to distinguish between co-existing antibodies of the same kind in a single sample of serum, a full evaluation of the diagnostic significance of these products cannot be achieved. A large amount of attention has been directed to the serology of dysentery since the beginning of the war, and in many respects advances have been made in our knowledge of this disease. One of the most recent contributions to the subject is contained in a report on the investigations of cases of dysentery by Professor Ernest Glynn and a number of collaborators. These reports have been published under the auspices of the Medical Research Committee.¹ Before endeavouring to summarize the contents of that part of this publication which is addressed to the subject of the agglutination reactions of dysentery, we cannot refrain from raising the question whether a scientist is justified in casting all endeavour to convey his thoughts in the English language to the winds and in indulging in a jargon of laboratory slang, with clumsy employment of unnecessary abbreviations. Added to this, many medical authors revel in a persistent confusion between patients and cases, and frequently obscure their meaning by want of clarity of expression in this regard. All these defects are abundant in Professor Glynn's report. His contempt for our tongue is manifested in the use of the word "examined" and other equally inexcusable expressions. The defects in the choice of language naturally are associated with a want of clearness of presentation. A scientific author who is guilty of these faults, has but himself to blame if the meaning he wishes to convey is not appreciated.

Professor Glynn set himself the task of estimating

the diagnostic value of agglutination with certain standard strains. Several variations in technique were used with the object of the selection of the most reliable. In the endeavour to determine the maximum power of a normal person's serum to agglutinate either Flexner's or Shiga's strains of dysentery bacilli, he has been tempted to record his results in a large number of tests carried out in unselected, apparently healthy individuals without a full record of their antecedents. From these tests he has fixed a standard for four types of bacilli. In the case of the so-called London strain of Shiga's bacilli a positive agglutination with a dilution of 1 in 64 is regarded as of diagnostic importance. In the case of the so-called Oxford strain of Shiga's bacilli the dilution indicating an infection was set at 1 in 96. The dilution of the Millbank strain of Flexner's bacillus indicative of dysentery is said to be 1 in 128 and that of the Oxford strain of the same organism 1 in 192. There are very marked differences in the susceptibility to agglutination of the various strains of Flexner's bacilli, and this difference is pronounced in the many published records. In the next place, Professor Glynn and his collaborators endeavoured to establish the diagnostic value of the tests by determining the titre at which the serum of persons convalescent from dysentery yielded positive results. The results indicate that the serum of 23.1% of the convalescents agglutinated Shiga's bacilli when the London strain was used, and of 20.1% when the Oxford strain was used. Similarly, 6.1% of the sera agglutinated the Millbank strain of Flexner's bacilli and 2.6% the Oxford strain. A comparison with the results obtained by other investigators reveals a wide discrepancy. Professor Glynn attempts to explain the high figures of Ledingham and Penfold and the low figures of Fildes. Whether these explanations are entirely satisfactory must remain an open question, but it seems as though the real reason why the serum of the majority of persons convalescent from dysentery fails to produce agglutination in these tests, is that a much greater variety of dysentery bacilli exists than is included in the four strains, and that unless the exact type of bacillus which has caused a particular infection can be ascertained, the agglutination can only be demonstrated in a variable proportion of cases. Professor Glynn finds that the tests are of diagnostic value, especially when the infection is due to Shiga's organism. He recognizes that the technique selected for the tests influences the results, according to the strains employed. He has evidence that infection agglutinins disappear very slowly from the serum. The irregularity of his results and of those of other observers, therefore, cannot be ascribed to the rapid disappearance of these antibodies. Another disturbing factor that has been examined, is the presence of co-agglutinins. He holds the opinion that there is a definite correlation between the agglutinins specific to Shiga's bacilli and those specific to Flexner's bacilli. This is at times caused by a mixed infection, but more frequently by co-agglutinins. Co-agglutinins are some-

¹ Reports upon Investigations in the United Kingdom of Dysentery Cases received from the Eastern Mediterranean. V., Report on 2,360 Enteritis "Convalescents" received at Liverpool from various Expeditionary Forces, by Professor Ernest Glynn, Dr. Emily M. Berridge, Dr. Vera Foley, Dr. Mary Price and Dr. A. L. Robinson, Medical Research Committee's publication, No. 7, 1918.

times absent. From these data it would seem that further research is needed before the best use can be made of the agglutination test in the diagnosis of dysentery.

COMBATING VENEREAL DISEASE.

The undergraduates of the University of Sydney, led by some fifth-year students of the Medical School, inaugurated, on October 12, 1916, a "University Society for Combating Venereal Diseases." The Chancellor of the University accepted the post of honour of Patron and the Dean of the Medical School allowed himself to be appointed President. The objects of the Society were (i.) to study the problems of venereal disease, prostitution and kindred evils, (ii.) to organize and stimulate University action in regard to such matters, and (iii.) to take the necessary steps to educate public opinion to secure suitable legislation, and to deal in any other effective way with the problem. The membership of the Society is open to all members of the University, from the immatriculated students in attendance at the courses of instruction, to the teachers, professors and members of the Senate. During the twenty months of its existence the Society has shown initiative and activity notwithstanding the difficulties of its task. At the inauguration, Mr. Meredith Atkinson, M.A., the Honorary Secretary, gave an account of the programme of the Society, and Professors J. T. Wilson and D. A. Welsh delivered addresses. These three speeches have been printed and circulated very widely throughout the State. In addition, eight lectures have been delivered to men and women undergraduates at the University, and a course of lectures was given to a public audience at the Trades Hall, in the month of March, 1917. The Council of the Society have devoted much time and energy to the consideration of matters of policy. A library is in course of construction, which will contain literature dealing with the various phases of the subject. It will be noted that every effort has been made to place the Society on a firm basis, and that the machinery has been cast with the object of extending its influence widely.

While the undertaking is primarily an organized campaign by undergraduates, the co-operation of graduates is being sought, because experience is essential in matters of this kind. Graduates of the University should give this plucky exhibition of social endeavour their practical support. The subscription is from 2s. 6d. per annum. The Society needs pecuniary support to enable it to conduct its business. Propaganda cannot be undertaken without money, and printing now-a-days is expensive. Graduates can also help by giving lectures to men who apply to the Society for information concerning sexual hygiene and venereal infections. The Society also invites members and others to present literature for inclusion in the library. At present the membership roll is 600. The majority of the members are undergraduates, and consequently their subscriptions are small. As an earnest of the seriousness and importance of the Society, we may append the names of some of the office-bearers. The Patrons are the Honourable Sir William P. Cullen, K.C.M.G., and Dr. Cecil Purser; the President is Professor Sir Thomas Anderson Stuart; the Chairman of the Council is Professor J. T. Wilson, F.R.S., and the Vice-Chairman Professor D. A. Welsh; the Acting Honorary Secretary is Dr. Ralph A. Noble, and the Honorary Treasurer Mr. H. R. R. Grieve. The Council also includes among its members Professor J. B. Peden, Professor A. Machie, Mr. H. E. Barff, Mr. Peter Board, C.M.G., Dr. E. H. Molesworth, Dr. Constance E. D'Arcy and Miss L. Macdonald.

CHEVRONS FOR OVERSEAS SERVICE.

A circular, issued by the Defence Department, which has been published in the District Orders of the various Military Districts, contains the conditions under which chevrons to denote service overseas are issued to returned officers, warrant officers, non-commissioned officers and men.

A red chevron is issued for service rendered before December 31 1914. The chevron earned after January 1, 1915, is blue, and all additional chevrons are also blue.

(4) The date of award of the first chevron in the case of overseas troops will be the date the individual left

his own country, or, where engaged in local operations, the date of crossing the frontier, or that on which he commenced to take part in active operations. Additional chevrons will be awarded for each successive aggregate period of twelve months' service away from the individual's own country or within a sphere of active operations.

(5) The qualifying service for additional chevrons need not be continuous. It will include periods of leave up to one month. Periods of absence without leave in prison or detention, in hospital for sickness due to avoidable causes, or in captivity as a prisoner of war, will be excluded when calculating the twelve months required to qualify for an additional chevron.

(6) Personnel of transport staffs, etc., who go overseas on duty of a temporary nature, but who are not appointed for duty on the establishment of a unit serving overseas, and who return to this country on completion of the temporary duty, are not eligible for the award of chevrons.

The remainder of the provisions have for their object the prevention of the wrong issue of chevrons.

BADGES FOR NEAREST FEMALE RELATIVES.

The wife, mother or nearest female relative of members of the Australian Imperial Force and of the Naval and Military Expeditionary Force is entitled to receive a badge indicating that the member of the Force has left Australia since August 4, 1914, for active service abroad.

A badge will also be issued to the nearest female relative of any member of the Australian Imperial Force or Naval and Military Expeditionary Force who, after enlistment for service abroad, died in a camp or a military hospital in Australia. The mother of a married officer or soldier will receive a badge as well as the wife, provided that one badge only be issued to either relative. Bars will be attached to the badges issued to mothers who have more than one son on service or returned from active service abroad. Each bar represents an additional son.

In the case of a married officer or soldier, the badge will be issued to his wife and the mother will also receive a badge, if she has no other son on active service. In the case of a widowed officer or soldier, the badge will be issued to the eldest daughter living or, if there be no daughter, to his eldest sister. In the case of an unmarried officer or soldier, the badge will be issued to the mother or, if the mother be dead, to the eldest sister. In the event of an officer or soldier not having a wife, mother or sister living, he will be required to nominate, in writing, his nearest relative. A foster-mother may receive the badge, if no relative is living. Badges are only issued to female relatives residing in Australia. Applications for badges have to be made on official forms, and the issue takes place from the headquarters of the Military District in which the soldier enlisted. Special regulations have been drawn up to meet the requirements of cases in which the nearest female relative resides in a State other than that from which the soldier enlisted. It is an offence under the *War Precautions Act, 1914-1916*, for any unauthorized person to wear the official badge or bar or any badge or bar so nearly resembling it as to be calculated to deceive. It is also an offence under the *War Precautions Act, 1914-1915*, for any person without the written authority of a competent military authority to sell, barter, exchange, trade in, give away or in any way dispose of or deal in any badge or bar, or any colourable imitation of such badge or bar.

The first session of the Royal Commission to enquire into the dispute between the friendly societies and the medical profession in Victoria, at which counsel have appeared, took place on May 27, 1918. A record of the proceedings will be published at a later date.

According to an announcement in the *Sun* (Sydney), of May 27, 1918, Colonel T. H. Dodds, D.S.O., who was formerly Adjutant-General in Melbourne, and Major T. W. Edgeworth David, C.M.G., have devised a scheme for the establishment of an Australian Army Field University. The proposal includes facilities to be given to men during the long spells out of the firing line to attend lectures and to engage in the study of various University subjects.

Abstracts from Current Medical Literature.

MEDICINE.

(190) Trench Nephritis.

W. M. Tytler and J. A. Ryle (*Quart. Journ. Med.*, January, 1918) publish a survey of their clinical experience and pathological studies of cases of trench nephritis. The clinical notes were based on 150 cases observed at a casualty clearing station, while the pathological data were derived from several sources. In regard to the aetiology, they find that there was usually no history of any predisposing illness. There was an increased incidence during the winter months. There was nothing to support the suggestion that the condition was due to geographical or to epidemic factors. In regard to the clinical appearances, they point out that the onset is usually sudden, and that the first symptoms are shortness of breath on exertion and swelling of the extremities and the face. The majority of the patients suffered from cough and a feeling of unfitness. The physical signs on admission were pallor, oedema and dyspnoea. The respirations were short and rapid, and there was impaired resonance and diminished air entry at the bases. Some cyanosis was often noted. Expectoration was usually not profuse, except as a terminal event. Bronchitis was a constant complication from December to February, while laryngitis and tracheitis were also seen. Pyrexia was absent in the majority of cases, save when bronchitis was present. In a few cases there were general symptoms of severe asthma without any external oedema. The urine contained albumin and casts, but was not scanty. Uræmia was rare, but the authors state that the experience of other casualty clearing stations indicates that cerebral symptoms at times occur with greater frequency. The mortality in their series was 4%. The treatment adopted included warmth and rest in bed, saline purgatives, oxygen for the dyspnoea, occasional hot packs and a light diet. They give a detailed account of the gross morbid changes and the histological appearances of the organs after death. The lungs are oedematous and contain a large quantity of pale, frothy fluid. At times the cut surface suggested that the air cells were filled with a soft coagulum. From the microscopical appearances they are inclined to regard the serous exudate in the alveoli as a primary process and the purulent bronchitis or bronchopneumonia as of secondary origin. Capillary thrombi were frequent, and some of the arterioles contained solid fibrin plugs. The spleen was usually congested and hæmorrhages into its substance were met with. This organ was not palpable during life. The changes in the kidney included swelling of the glomeruli, increase in the number of nucleated cells and proliferation of the tubular epithelium. A series of bacteriological examinations was undertaken. In one case out of

ten an organism similar to the pneumococcus was recovered from the blood. In 24 out of 40 cases streptococci of the enterogenous type were isolated from the urine. Streptococci were also occasionally recovered from the throat, lungs, spleen and kidney. The authors do not consider that the bacteriological results have any important physiological bearing. They lay considerable emphasis on the predominance of the pulmonary changes, and call attention to the fact that there is a striking clinical resemblance between cases of trench nephritis and cases of gas poisoning. They show, however, that inhaled gas or fumes were definitely not responsible for many of their cases. They are inclined to the opinion that the kidney lesion is not the basis of the condition.

(191) Pyrexias of Doubtful Origin.

"P.U.O.," "N.Y.D.," influenza and trench fever, are the official designations of a large proportion of pathological conditions occurring in members of military divisions at the front. The late Captain C. K. McKerrow has undertaken a close clinical study of pyrexias of doubtful origin. He publishes the results of these observations in the *Journal of the Royal Army Medical Corps*, of February, 1918. In the absence of bacteriological guidance, he has endeavoured to group the cases according to their symptoms and natural history, and, as a result, he has differentiated four types of cases. The first group consists of men who complain of pain all over. They describe the pain as that of having been beaten. It is usually referred to muscles, which are distinctly tender on pressure. There is pyrexia of from 38.4° to 39.4° C. The attack comes on suddenly and in 60% of the cases the author noted some congestion of the fauces and a slight cough. In about a quarter of the cases there is purulent nasal discharge. The second group comprises men who complain of pain in the shins. The onset may be sudden or gradual. Pyrexia is usually not severe. The patients state that the shin bones feel as if they had been scraped with a knife. The tibiae are acutely tender, and the pain is worse at night. Over one-third of the total number of cases investigated belonged to the second group. In the third group the complaint is of pain in the head. The pyrexia is moderate, the onset usually sudden and the course very short. Nearly half of the patients exhibit naso-pharyngeal conditions. In the fourth group the most striking symptom is weakness. The onset is usually gradual, the pyrexia is slight and the patient looks pale and tired. This group accounts for the smallest number. Over half of the patients are treated entirely with their units, which means that they are able to return to their duties within a relatively few days. The remainder of the patients were sent into hospital, but many of them also made rapid recovery. Of the whole series of cases, 70% recovered rapidly. The treatment employed consisted of the administration of 0.6

gm. of salicylates, no food and a large quantity of hot water. The patients in the first group nearly all recovered quickly. About 5% had relapses. In the second group rapid complete recovery was seen in only 11%. In 41% definite relapses were observed. Second and third, relapses occurred. In the third group 70% of the cases clear up rapidly and completely. In this group 14% of the patients developed pains in the shins and had relapses of their fever. There were 13 cases of the fourth group. Of these, five cleared up rapidly and completely, eight were sent to hospital and two did not return. The remaining six patients developed pains in their shins. The illness in all these six cases proved obstinate and several relapses occurred. The author comes to the conclusion that the shin pain type of affection appears to differ markedly from the others. It is resistant to treatment and persists in spite of the administration of salicylates. It shows a great tendency to relapse. The author attempts to elicit the facts bearing on these affections by following the movements of his unit. From these details it appears that during the hot weather, notwithstanding the prevalence of flies and the indifferent sanitary conditions, very little pyrexia was met with. A few cases were noted when a new line was taken over, in which the trenches were good and dry, but the sanitary condition in the neighbourhood bad. Shortly after this, cases of pyrexia associated with shin pains occurred in groups, suggesting that some infective agent was at fault. He is disinclined to accept the German view that there is an infective periostitis in these cases, nor can he concur with the suggestion that they represent an infective neuritis. Another theory that has been put forward is that these cases are malarial. He tried the effect of quinine on a few cases but, as the affection died out soon after, he was unable to determine whether quinine did good or not. He is disinclined to believe that the pressure of wet puttees could lead to a type of chronic infection. He is convinced that the infection is a general one. Against the idea that it is a disease of exhaustion or of wet trenches is the fact that during the severe winter his men were working very hard and there was no pyrexia at all. He is unable to determine whether rats or lice carry the infection, but he points out that both were largely represented in the trenches.

(192) Sulphæmoglobinæmia.

W. C. Long and E. I. Spriggs record an interesting case of sulphæmoglobinæmia in an unmarried lady, aged 32 years (*Quart. Journ. Med.*, January, 1918). The patient was apparently a highly neurotic individual, who had had repeated attacks of "breaking down," and whose chief complaint was constipation, nausea, vomiting and pain on the lower part of the abdomen. On examination, the authors failed to discover a cause for a severe anæmia associated with cyanosis. In

the course of some days, the patient vomited all the food taken and complained of pain and discomfort. Diacetic acid and acetone were present in the urine for a short period. The total amount of urine was diminished. Later on she had an attack, during which her colour became dusky and her expression vacant and strange. She became unconscious. The attack was repeated and led to a suspicion that the cyanosis might be enterogenous and that the condition might be a methæmoglobinæmia. Spectroscopic examination of the blood revealed the band of sulphæmoglobin. The serum on one occasion gave a positive reaction for nitrites. A trace of nitrites was found in the urine for a short time and the saliva gave a strong reaction. It has been suggested that sulphæmoglobin can be produced by the action of sulphuretted hydrogen passing through the blood. A mere trace suffices when strong reducing agents are associated with oxyhæmoglobin. Mackenzie Wallis discovered a nitrite-producing bacillus in five cases. A bacillus of this kind was not discovered in the case of the authors' patient. Her condition improved considerably, in response to a diet composed largely of carbohydrates, the use of purges and antiseptic medicines and the removal of carious teeth. The symptoms, however, were not entirely removed.

NEUROLOGY.

(193) The Ovaries in Mental Disease.

Laura Forster (*Proc. Roy. Soc. of Med.*, May, 1917) made a histological examination of the ovaries in 100 cases of insanity, and found that in *dementia præcox* all who had reached the age of 30 years showed signs of early involution, marked by an increase of interstitial connective tissue and a great scarcity of Graafian follicles; and even in those much below this age there was a distinct reduction in the number of the follicles as compared with normal women of the same age. In imbecility, with or without epilepsy, the findings varied. Some quite young imbeciles showed early involution, while in others the follicles were relatively numerous. In melancholia and in mania the follicles were decidedly reduced in number, and the same applied to general paralysis. The important conclusion from these results is that where there is disease of the brain, or mental incapacity associated with it, the power of the individual to reproduce her kind, if not absolutely cut off, is at least reduced, and in most cases an early cessation of ovarian function seems to take place. The results further indicate that there is an intimate dynamic relation between the ovary and the brain, so confirming Ceni's observation on this point. (Ceni removed one cerebral hemisphere from birds, and found that it reduced and, in some instances, annihilated the egg-laying capacity; it also caused premature progressive in-

volution of the ovaries.) This work of the lately deceased writer was carried out in Mott's laboratory, who, in an addendum, suggests that in any future investigation which may be made, finer changes should be studied and information sought as to whether or not, in certain adolescent forms of insanity, e.g., *dementia præcox*, a primary degeneration of the ovum, recognizable in the immature follicles, occurs.

(194) The Mechanism of True and False Ankle Clonus.

Noica (*Rev. Neurol.*, Nos. 8 and 9, 1917) seeks an explanation of Babinski's observation that in some cases, when there is no lesion of the pyramidal tract, clonus may be evoked by urging the patient to press down with the ball of the foot, while the ordinary test is being made. He found, in the case of 11 soldiers, each with one leg recently amputated, that this artificial clonus was present in the opposite sound limb, and was specially easy to evoke when these men were in somewhat low health. Also in two others, not cases of amputation, but with wounds on the side of the foot, he found a true clonus in the wounded and an artificial clonus in the sound limb. He concluded that in these cases the true and the artificial clonus both depended upon an exaggeration of the tendon reflexes, and if in certain cases without lesion of the pyramidal tract, or in certain normal subjects the ankle reflexes be lively, it is easy by the artifice above mentioned to make them exaggerated. The artifice is akin to that of Jendrassik for reinforcing a sluggish knee-jerk. As to the mechanism of ankle clonus, he thinks an involuntary and repeated contraction of the calf muscles is the essential factor, it has nothing to do with the action of antagonistic muscles. It is also essential that the calf muscles be put on the stretch. In short, if the Achilles tendon reflex be exaggerated by a lesion of the pyramidal tract, or if it be lively, as in the cases mentioned, we can make it exaggerated by putting tension on the Achilles tendon, as in the described artifice.

(195) Frontal Lesions Simulating Lesions of the Cerebellum.

Gordon (*Journ. Nerv. and Ment. Dis.*, October, 1917) reviewed the symptomatology of lesions of the frontal lobe, discussed differential diagnosis and recorded four cases (two of tumour, one of abscess and one of hæmorrhage). Clinically, the difficulty is one of localization, exemplified by the recorded instance in which the cerebellum was exposed and the lesion afterwards found in the frontal lobe. A cerebellar head position, ataxia, a tendency to fall to one side, asynergia and dysmetria, all suggesting cerebellar disturbance, might arise from a frontal lesion and might receive anatomical explanation from known fronto-cerebellar association tracts. Careful clinical examination might promote but not always establish correct diagnosis. Three conditions which characterized lesions of the cerebellum,

and were absent altogether or undecidedly present in frontal lesions, should be looked for. (1) Loss of resistance, as described by Holmes and Stewart and André Thomas (if opposition to flexion of the arm be suddenly withdrawn, the movement of flexion continues and the hand may strike the chest violently). (2) Delay in the execution of voluntary acts, the adiadokokinesia of Babinski, shown by interference with the ability to pronate and supinate the forearm. (3) Atonia, indicated by the "pendulous" type of knee jerk. It was made plain that the avoidance of mistakes demanded a sound acquaintance with clinical neurology.

(196) Treatment of Bladder in Gunshot Wounds of the Spine.

Besley (*Journ. Amer. Med. Assoc.*, August, 1917) makes a strong plea for the non-catheterization of the urinary bladder in cases of bullet wounds of the spinal cord. Logic and experience had taught the writer that in such cases the bladder should not be emptied by catheterization, unless there be a pathological stricture of the urethra to prevent overflow. He had never seen any deleterious effects from simple over-distension of the bladder. In one case of benign spinal cord tumour, which was removed, the bladder was for two years distended up to the umbilicus, and yet the patient regained complete vesical control, and showed no sign of kidney disturbance. The writer held that it is almost impossible to catheterize the bladder in a case of gunshot myelitis, accompanied by paralysis, without infecting and producing inflammation of the genito-urinary tract. Infection rarely, if ever, occurs without catheterization. Distension of the bladder, allowing it to overflow, is not harmful to the bladder or kidneys. Many suffering from spinal injury may ultimately be saved by surgical operation, if they do not succumb to early cystitis and purulent pyelitis.

(197) The Endocrine Organs in Dementia Præcox.

Kojima (*Proc. of Roy. Soc. of Med.*, May, 1917), working in the pathological laboratory of the London County Asylums, directed by Dr. Mott, carefully examined the endocrine organs in two cases of *dementia præcox*, one in a male, the other in a female. His summarized findings were that the thyroid of the male had an entirely different appearance from that of the female, namely, indications of hypofunction as against those of hyperfunction. Also between the parathyroids there were differences, those of the male containing clear, watery cells and a few eosinophil cells; those of the female, on the contrary, many eosinophil cells. Further, the adrenals in the female were very small, and there was a diminution of lipid substance in the cortical cells. And lastly, striking changes were noticed in the reproductive glands, in the case of the male, the testes gave very slight evidence of spermatogenesis, while the ovaries of the female seemed to be undergoing an early involution.

MILITARY ORTHOPÆDICS.

A conference, arranged by the Deputy Director-General, Medical Services, was held at the Defence Department on April 24 and 25, 1918, for the purpose of eliciting opinions upon the whole question of military orthopædics.

The central administration was represented by Surgeon-General Cuscaden, D.D.G.M.S., who presided, Lieutenant-Colonel Thwaites, Staff Officer for Medical Services, and Mr. Auger, Manager of the Commonwealth Artificial Limb Factories, the 1st Military District by Lieutenant-Colonel Cameron, 2nd Military District by Colonel Sir Alexander MacCormick, 3rd Military District by Colonel Syme, and the 4th Military District by Lieutenant-Colonel Cudmore. The following gentlemen also attended and took part in the deliberations:—

Majors Kater and Wade, from the 2nd Military District. Colonel Sturdee, Lieutenant-Colonel Stanley Argyle, Major Murray and Captain Syme Johnson, from the 3rd Military District. Lieutenant-Colonel Hadley, from the 5th Military District.

In opening the proceedings, General Cuscaden stated that the matters for discussion covered the whole range of surgical orthopædics, prosthetics and allied subjects. He said that, speaking broadly, a very large number of our best and most valuable men have, as a result of active naval and military service, suffered impairment of structure and function of parts of their physical frames; and that the object in view in arranging this conference was the framing of a comprehensive programme for securing that everything which can be done, should be done to restore these impaired members to their normal standard of efficiency. Regarding prosthetics, a good deal had already been done, including the establishment in the several States of artificial limb factories, under the supervision of an expert brought out from America. The Victorian factory was now in almost full working order, and it was anticipated that the remainder would be opened within a very short time. Regarding surgical orthopædics, he said that every effort had been made to secure the best surgical equipment and appliances and the services of the most expert orthopædic surgeons in Australia. A good beginning had also been made in that vast field of physiotherapy which includes thermo-, hydro-, and electro-therapy and massage. In this connexion curative workshops were being established at the various military hospitals. The first duty of those taking part in the conference would be to determine what additional measures could be taken, along the lines indicated, to promote the best interests alike of our maimed soldiers and sailors and our country and nation, and, to this end, he impressed upon all that no limitation need be placed upon the scope or nature of their enquiries, discussions, criticisms, or recommendations. Finally, he stated that the Department aimed at extending and improving our present means and methods wherever desirable and practicable, and at systematizing them and making them uniform throughout Australia, so that equal consideration might be shown and equal benefits accrue to our men in whatever part of Australia they might be located.

Colonel Sir Alexander MacCormick, who opened the discussions, expressed himself strongly in support of the Department's arrangements for making and fitting artificial limbs in its own factories, under the supervision of its own medical officers, which he considered a far better plan than sending men to outside artificial limb manufacturers. These remarks were concurred in by a number of other gentlemen present. Colonel Sir Alexander MacCormick added that in all cases a provisional or temporary leg should be supplied at the outset and a permanent one later on. On General Cuscaden asking for a definite expression of the opinion of the meeting on this point, all were found to be in agreement.

General Cuscaden, Colonel Sir Alexander MacCormick, Colonel Syme, Lieutenant-Colonel Cameron, Major Wade and Major Kater then entered into a further discussion, in which it was finally agreed that the provisional limb could be quickly and cheaply made, and should not cost more than about 7s. 6d. on the average. Lieutenant-Colonel Thwaites then pointed out that most of these amputation cases were dealt with in the first instance overseas, and did not come

into their hands in Australia until the provisional stage had passed.

General Cuscaden pointed out that it did not seem to be the regular practice, when medical officers ordered a limb, for the patient to return to the medical officer after having been fitted by the limb maker, in order that the limb might be examined and certified as satisfactory. He asked for an expression of opinion as to whether this should be done in all cases. All agreed that it should.

Colonel Sir Alexander MacCormick then initiated a discussion upon artificial arms, and said that in England the Carne arm had proved more or less a disappointment. Major Wade stated that this arm was quite unsuitable for a man engaged in a laborious occupation. Colonel Syme endorsed this view, as also did Lieutenant-Colonel Cudmore, who added that some men did quite well with these arms while under the supervision of the instructor, but later dropped back again. Major Murray said some men did not possess the right standard of mentality for the successful use of this arm. Colonel Syme pointed out that although the surgeon might not think this type of arm the most suitable for a particular man, the man himself almost invariably demanded it, because he knew it to be dearer than the others, and concluded from this fact that it must also be better. In reply to this, General Cuscaden said that the decision as to the type of arm to be supplied must be left to the surgeon, and that the surgeon, in each case, must order whatever type of arm he considered most suitable. Colonel Sir Alexander MacCormick suggested that it might be fairest and best to supply only one type of arm. Lieutenant-Colonel Thwaites stated that the Manager of the Commonwealth Artificial Limb Factories had expressed himself as confident that when the factories were in full working order, they would be able to supply a type of artificial arm superior to all others available. Acting upon this, the Department had decided upon making the principal supplies from its own factories. Provision had been made, however, for other standard types to be provided whenever such were considered desirable. In endorsing these remarks, General Cuscaden repeated his statement that the decision as to the type of arm to be supplied should be left to the surgeon in each case. General agreement was expressed with this ruling, and the discussion of this matter closed.

The next matter discussed was curative workshops. General Cuscaden stated that these institutions were in general use in France and in England, and were apparently regarded with favour in both countries. The object of such institutions was to provide both the means for, and the incentive to the performance of movements conducive to the restoration of the function and the re-education of damaged parts. In order to achieve their object fully such measures must be carried out under medical supervision. These institutions should, therefore, be established in connexion with the military hospitals. Major Murray strongly emphasized the desirability of such work leading to the production of something definite and useful, thus giving the man more interest in it and encouraging him to persevere. Major Kater said that in many cases the only alternative to engaging in some useful and interesting work of this nature was sitting around the grounds smoking or going about the cities on leave.

Lieutenant-Colonel Thwaites said that it had been ruled that curative workshops were under the ægis of the Defence Department, while vocational training was a matter for the Repatriation Department. These two activities were closely inter-related, and one should merge into the other. There was a danger of a hiatus being created between the two and men falling through the gap.

Colonel Syme, Lieutenant-Colonel Cameron, Major Wade and Captain Johnson strongly supported the view that the closest co-operation should be established and maintained between the two Departments in this respect.

General Cuscaden asked if all were agreed that curative workshops should be established in connexion with the military hospitals. The reply was unanimously in the affirmative. General Cuscaden then stated that a considerable number of discharged soldiers of the No. 3 Military District were engaged in somewhat similar work at the Melbourne Workingmen's College. He had, therefore, conferred with the Principal of that College, who had submitted a plan for providing the buildings, equipment, and teaching

experts necessary for such activities as carpentering, plumbing, moulding, etc. The plans and specifications were passed round for the information of members of the conference and for discussion. In answer to a question, General Cuscaden pointed out that although the building shown in the plan appeared small, being 68 feet by 35 feet, it would accommodate 55 workers at one time, and was to be regarded as a unit. To meet larger demands further units could be added. The Principal of the Melbourne Workmen's College strongly advocated this unit system. In answer to another question, General Cuscaden said that in appropriate cases this form of treatment would be prescribed by the medical officers and was, therefore, and to that degree, compulsory, although it must be recognized that it could hardly be enforced in the case of discharged soldiers. Captain Johnson said that about 40% of all patients in hospital would benefit by such treatment, and the provision to be made for it would therefore be considerable. General Cuscaden replied that the units could be increased in number to meet any requirements. The question whether curative workshops should be established in connexion with all military hospitals, or only in connexion with certain selected hospitals where cases of the appropriate type would be concentrated, was then discussed, and it was decided that as conditions varied so much in different districts, decisions on this point should be left to the several Principal Medical Officers. Lieutenant-Colonel Hadley said that a good deal of noise would be made in these workshops, and they should, therefore, be placed a little way away from the rest of the hospital.

Major Wade asked whether, in the event of amendments to the plans being found desirable after they had been put to the practical test, these could be made. General Cuscaden said that could readily be done. After further discussion, it was finally agreed that the plans and specifications produced should be adopted for the time being, as the standard for all such workshops, and carried into effect at once in all districts. General Cuscaden said that instructions had already been issued for the establishment of curative workshops in all the States. All these would now be built and equipped in accordance with the adopted plan.

The conference then passed on to the discussion of a proposal put before it by General Cuscaden to appoint a Consulting Orthopaedic Surgeon for each district to supervise all matters of surgical orthopaedics. Lieutenant-Colonel Hadley suggested as an alternative that one such consultant should be appointed to travel through all the States. Colonel Syme said that something of the kind was wanted, and he favoured Lieutenant-Colonel Hadley's proposal. Colonel Sir Alexander MacCormick, Lieutenant-Colonel Cudmore, Major Wade and Captain Johnson also expressed themselves as in agreement with Lieutenant-Colonel Hadley's suggestion. A definite motion to that effect was put and carried unanimously. It was further agreed that the appointment should be a full time, temporary one.

The remainder of the sitting of the conference was devoted to the discussion of the physio-therapeutic measures referred to by General Cuscaden in his opening address, i.e., thermo-, hydro-, and electro-therapy and massage. Lieutenant-Colonel Argyle said that the equipment of these departments should be standardized in the same way as had been done in the case of curative workshops. General Cuscaden said that this might not be possible owing to the different electrical supplies in the different States, and Major Murray added that it was not always possible to obtain full supplies of apparatus of the exact makes and types desired. The Chairman then invited Captain Syme Johnson to read some notes he had prepared on the subject of the organization of, and provision for this work in Australian medical units overseas. For the information of the members the Chairman stated that Captain Johnson, before returning to Australia, was detailed by the D.M.S., A.I.F. (General Howse), to make a special study of, and enquiry into these matters. The outstanding character of these notes was the position of paramount importance given to physio-therapeutic measures in all the stages of treatment, from the first infliction of the injury to the final stage of maximum cure. The Australian Army Medical Services had endeavoured, Captain Johnson said, to keep up with the very rapid progress made in Europe in these lines of

treatment, and to that end had detailed to it medical men with special knowledge and experience, and provided excellent and up-to-date equipments of various kinds. But the great weakness had been in the staff. There was a great deficiency of skilled workers, such as masseurs and masseuses. The amount of work could not be coped with by the skilled personnel available, and this accounted for many of our wounded men being sent back to Australia in an unsatisfactory condition. He was convinced that the same difficulty would be encountered in Australia when measures were being taken to bring the standard of our treatment of this type up to that which prevailed elsewhere. The principle of trying to train unskilled orderlies in this work in three months or so was not only a failure, but was absolutely dangerous, and he condemned it utterly. He strongly urged that the specially trained personnel for this work should be increased, not only in Australia, but also on the transports bringing our men home, and in the medical units overseas. Speaking with special regard to the work in Australia, he said the requirements were an increase in both quantity and equipment and, above all, an increase in the numbers of the skilled members of the staffs employed. He believed that to get the best results in this line of treatment patients should be segregated in selected hospitals, specially staffed and equipped. When such institutions were being created, he very strongly urged that they should be modelled upon the one established by the Royal Army Medical Service at Shepherd's Bush, London, which was probably the most efficient medical unit in existence.

In the course of the discussion which followed, Major Murray said that the necessary number of trained people did not exist in Australia. Major Wade suggested that a number of competent persons who were engaged in private practice would give their service if sufficient inducement were offered, particularly if their services were accepted on a part-time basis, such as three afternoons per week. Major Kater thought the part-time proposal would lead to the best results. Captain Johnson said that undoubtedly considerable dissatisfaction regarding status, rank and pay existed amongst those already employed in the military massage service, and that these grievances operated to deter others from joining the service. Major Murray endorsed the statement that there was dissatisfaction regarding status, and quoted some of the factors causing this dissatisfaction. In England, he said masseuses were allowed to wear distinctive uniform, but when they arrived back in Australia, they were told to take it off. In regard to promotion, some who began three years before as Staff Nurses were still Staff Nurses; apparently no provision had been made for promotion. Captain Johnson said that owing to the unsatisfactory conditions under which trained masseurs and masseuses had to work, the number of students entering upon the course of training for this profession was going down. Consequently the position would become more acute instead of improving, unless some radical changes were made, and he added that while the number of skilled workers in this branch of the service was decreasing, it was, on the other hand, being flooded with a number of unskilled and undesirable persons holding relatively high rank. He instanced the case of an untrained and unskilled "pub keeper," who was sent overseas with the rank of Staff Sergeant Masseur and pay considerably greater than that granted to a skilled masseuse. On the termination of this discussion, General Cuscaden said that if the conference carried a resolution affirming that such an unsatisfactory state of affairs existed, and recommending increased status and privileges for members of the Massage Service, he would lay the matter before the proper authorities. Captain Johnson then moved and Major Wade seconded:—

That, in the opinion of this Conference, in view of the presumable necessity for large increases of its personnel, the status of the Australian Massage Corps should be entirely revised in respect of the question of military rank and privileges and of opportunity for qualifying for promotion and increased pay.

This resolution was carried unanimously, and the Conference then closed.

The Minister of Defence announced on May 22, 1918, that medical students in the first, second or third year would be

allowed to enlist as combatants in the Australian Imperial Force. Medical students in the fourth or fifth year could also enlist as privates, but they would be granted leave of absence, without pay, for the purpose of finishing their medical course. After graduation, these men would be granted commissions in the Army Medical Corps, Australian Imperial Force, if the war were still in progress.

Naval and Military.

CASUALTIES.

In the 402nd list of casualties sustained by Australian troops, which was issued on May 22, 1918, there is an entry to the effect that Captain John Gray has been wounded. The 403rd list was issued on May 25, and contains the name of Major Kenneth Nugent Steele, who has been wounded (gas). The 404th list, which was issued on May 27, contains the official announcement of the death of Major Cedric Alwyn Stewart, who, as announced in our issue of May 25, 1918, has been killed in action.

HONOURS.

In the *Commonwealth of Australia Gazette*, No. 76, of May 23, 1918, the following notice appears among a considerable number taken from the *London Gazette* of January 4, January 14 and January 15, 1918:—

The King has been graciously pleased to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire, for services in connexion with the war:—

To be Members of the said Most Excellent Order.

Major Walter Henry Tofft, A.M.C.

War Office,

9th January, 1918.

With reference to the awards conferred as announced in the *London Gazette*, dated 26th September, 1917, the following are the statements of service for which the decorations were conferred:—

Awarded the Military Cross.

Captain John Canute Gordon Glassford, A.M.C., for conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. He continued to work calmly for several hours under violent and accurate hostile fire, during which his dug-out was three times hit and considerably damaged. Throughout the operations he displayed a magnificent example of gallantry and devotion to duty, and inspired all under him with a like disregard of personal risk. Much of his work was done in the open and under very trying and dangerous conditions, but the cheerfulness and imperturbability which he maintained in the face of danger were of the greatest assistance in the speedy evacuation of the wounded.

The following have been mentioned in the despatches from General Sir Archibald Murray, K.C.B., late Commander-in-Chief, Egyptian Expeditionary Force.

Staff.

Major (temporary Lieutenant-Colonel) M. W. Cave, A.M.C.

Colonel R. M. Downes, A.M.C.

Army Medical Corps.

Major W. Evans.

Major W. R. C. Mainwaring.

Major E. K. Parry.

Lieutenant-Colonel A. H. Thwaites.

The following have been mentioned in the despatches from General Sir Edmund Allenby, K.C.M.G., K.C.B., Commander-in-Chief, Egyptian Expeditionary Force.

Medical Corps.

Captain J. F. G. Fitzhardinge.

Captain H. Sutton.

The King has been graciously pleased to confer the under-mentioned rewards for gallantry and distinguished service in the field. The acts of gallantry for which the decorations have been awarded will be announced in the *London Gazette* as early as practicable:—

Awarded the Distinguished Service Order.

Captain George Vernon Davies, A.M.C.

Awarded a Bar to Military Cross.

Captain David MacDonald Steele, M.C., A.M.C.

Awarded the Military Cross.

Captain Archibald John Collins, A.M.C.

Captain Eric Macallam Gordon-Glassford, A.M.C.

Captain Hugh Edward Kirkland, A.M.C.

Captain Guy Ardlaw Lawrance, A.M.C.

Captain John Shaw Mackay, A.M.C.

Captain Melrose Holtom Mailer, A.M.C.

Captain William Dempsey Quilty, A.M.C.

Captain Clive Frederic Robinson, A.M.C.

We have to congratulate Dr. Edith Barrett on the distinction which has been conferred on her by His Majesty the King for her valuable services as Honorary Secretary to the Red Cross Society in Victoria. She has been created a Member of the Order of the British Empire. It will be remembered that Dr. Edith Barrett was made an Officer of the Order of the British Empire (see *The Medical Journal of Australia*, March 23, 1918, page 245). Her promotion is an indication of the recognition of the value of her services to the Empire.

APPOINTMENTS.

Australian Imperial Force.

Army Medical Corps.

To be Captains—

Honorary Captain R. M. Allan, Australian Army Medical Corps Reserve. Dated 22nd April, 1918.

Honorary Captain R. J. Verco, Australian Army Medical Corps Reserve. Dated 24th March, 1918.

Honorary Captain J. S. Proctor, Australian Army Medical Corps Reserve. Dated 22nd March, 1918.

Honorary Captain J. K. Patrick, Australian Army Medical Corps Reserve. Dated 6th April, 1918.

Honorary Captain A. P. Derham, M.C., Reserve of Officers. Dated 1st May, 1918.

Ulick Lancelot Bourke, Ormond Gillespie Tunks, George Jacob Maxwell Saxby, and Frank Eric Raymond Biggs. Dated 3rd April, 1918.

James Wall. Dated 11th April, 1918.

Percival George Crago. Dated 15th April, 1918.

Thornleigh Farranridge. Dated 20th April, 1918.

Arthur Ernest John Scott. Dated 23rd April, 1918.

John Ferguson Chambers. Dated 24th April, 1918.

Aloysius Barbata. Dated 1st May, 1918.

Donald Greig May. Dated 6th May, 1918.

Appointments Terminated.

The appointments of the undermentioned officers are terminated from date stated opposite names:—

Colonel T. M. Martin, C.M.G. 22nd April, 1918.

Major R. E. Dunn. 25th April, 1918.

Major J. Kenny. 10th April, 1918.

Major D. Gwynne Hughes. 27th April, 1918.

Major C. L. S. Macintosh, D.S.O. 2nd May, 1918.

Captain E. W. F. Dolman. 4th April, 1918.

Captain E. L. Morgan. 9th April, 1918.

Captain H. O. Chapman. 23rd April, 1918.

Captain J. P. Wilson. 30th April, 1918.

Captain D. M. Ross. 1st May, 1918.

Captain E. S. Smalpage. 18th March, 1918. (This cancels the notification respecting this officer which appeared in Executive Minute No. 238/1918, promulgated on page 652 of *Commonwealth of Australia Gazette*, No. 52, of 11th April, 1918.)

Medical Officers.

Lieutenant-Colonel J. M. Y. Stewart, D.S.O., V.D., from No. 15 Field Ambulance, to command No. 1 Australian Dermatological Hospital, and is granted the temporary rank of Colonel whilst commanding. 23rd January, 1918.

To be Majors—

Captains S. H. Seccombe, S. H. Weedon, A. W. H. A'Court, W. K. Inglis, R. J. N. Whiteman, L. G. Tassie, H. H. Montgomery, J. V. H. Guest, N. H. Fairley, D. D. Coutts, A. E. Cullen, C. R. Merrillees, C. J. Simpson, J. M. Alcorn, H. M. North, E. A. Sanbrook, E. S. Harrison, L. C.

Lade, V. F. Crowe, L. B. Elwell, M.C., C. C. Simson, M.C., H. A. Hagen, F. Macky, A. M. Davidson, H. H. McWilliams, E. M. Allester, H. N. Featonby, J. V. Pearce, and A. J. Collins, M.C. 28th January, 1918.

The following appointments, etc., have been announced in the *Commonwealth of Australia Gazette*, of May 23, 1918:—

1st Military District.

Australian Army Medical Corps—

Lieutenant-Colonel (Honorary Colonel) A. Sutton, C.M.G., is granted pay at the rate of £525 per annum whilst holding position of Principal Medical Officer. Dated 8th March, 1918.

Captain (Honorary Lieutenant-Colonel) J. E. Dods, D.S.O., M.C., is Lieutenant-Colonel (temporarily) whilst employed as President, Permanent Medical Referee Board (part-time). Dated 9th March, 1918. (This cancels the notification respecting date of appointment of this officer which appeared in Executive Minute No. 239/1918, promulgated on page 656 of *Commonwealth of Australia Gazette*, No. 52, of 11th April, 1918.)

Captain (Honorary Lieutenant-Colonel) W. A. Fraser, D.S.O., is transferred to Australian Army Medical Corps Reserve. Dated 5th January, 1918.

Australian Army Medical Corps Reserve—

Alfred John Spencer Cecil Roberts is Honorary Captain. Dated 8th April, 1918.

Honorary Captain A. Stewart is Honorary Major. Dated 15th April, 1918.

2nd Military District.

Australian Army Medical Corps Reserve—

Arthur John De Size Howard is Honorary Captain. Dated 13th August, 1916.

The resignation of Honorary Captain M. S. Atwill of his commission is accepted. Dated 15th March, 1918.

3rd Military District.

Julian Augustus Romain Smith is Honorary Major. Dated 1st May, 1918.

Alexander Hugh Melville is Honorary Captain. Dated 6th April, 1915.

Clive Shields and Edgar Montgomery Herbert Inglis are Honorary Captains. Dated 1st May, 1918.

Honorary Captain H. M. Hewlett is granted temporary rank and pay of Major at rate prescribed by Financial and Allowance Regulation 340 whilst holding position of Radiologist. Dated 26th April, 1918.

Honorary Captain R. H. Gibbs is granted temporary rank and pay of Major at rate prescribed by Financial and Allowance Regulation 340 whilst employed at No. 16 Australian General Hospital (Macleod). Dated 1st May, 1918.

Honorary Captain M. D. Nesbitt is transferred from Australian Army Medical Corps Reserve, 4th Military District, with seniority as from date of transfer. Dated 15th April, 1918.

4th Military District.

Australian Army Medical Corps—

Honorary Captain W. A. James is granted temporary rank and pay of Major whilst employed as member of Permanent Medical Referee Board and Staff of No. 7 Australian General Hospital. Dated 15th March, 1918.

Australian Army Medical Corps Reserve—

Honorary Captain M. D. Nesbitt is transferred to Australian Army Medical Corps Reserve, 3rd Military District, with seniority as from date of transfer. Dated 15th April, 1918.

5th Military District.

Australian Army Medical Corps—

Honorary Captain D. G. Robertson is granted temporary rank and pay of Major whilst employed as member of Permanent Medical Referee Board (part-time). Dated 19th February, 1918.

We have received a statement from the Committee of the Northern Suburbs Medical Association dealing with

certain passages contained in the obituary notice of the late Dr. Francis. As the statement was handed to us just before we went to press, we deemed it advisable to defer its publication for a week, in order that opportunity could be given us to consider it carefully.

RED CROSS APPEAL.

In the list published in last week's issue of contributors to the Victorian Division of the Red Cross Society, the name Dr. Drane should have been Dr. H. Deane. The other Dr. Deane mentioned in the list is Dr. J. E. Deane.

INFECTIVE DISEASES.

Bulletins of the Quarantine Service, Nos. 7, 8 and 9, were issued on March 29, April 12, and April 26, 1918. The following information is contained.

Variola.

No cases of small-pox were reported in Australia between March 15 and April 11, 1918.

At Singapore, in the Straits Settlements, three cases and three deaths were reported during the period from January 14 and February 25, 1918. At Manila, in the Philippine Islands, there were 20 cases and 3 deaths, in addition to 57 cases of varioloid and 1 death between January 27 and March 16, 1918. From Zamboanga, a Bill of Health refers to 10 cases having been notified during the fortnight ending March 20, 1918. From India information concerning 7 deaths from variola was received during two isolated weeks, ending February 9 and March 2. Three deaths were registered in Rangoon, Burma, during the week ending March 2, 1918.

Plague.

The spread of plague in India has been extremely rapid. Between January 13 and February 16, 1918, there were 181,229 cases and 145,113 deaths. The January plague mortality has been exceeded only once before, namely, in January of 1905. It is mentioned that the disease had broken out at Vizagapatam Port, on the eastern seaboard of the Madras Presidency, a region hitherto free from plague.

In Ceylon there were 17 cases between February 9 and March 21. During the three weeks ending February 28, 1918, there were 39 cases and 31 deaths in Egypt. From Java comes information concerning 108 cases and 108 deaths during the period between January 1 and February 11, 1918. In the week ending March 2, 1918, there were 98 deaths from plague at Rangoon, Burma. The disease is still prevalent in the Straits Settlements. In Singapore there were 37 cases and 34 deaths between March 10 and April 20, 1918, while in Penang one case was reported on April 13.

Cholera.

Bills of Health issued in India record that there were 21 deaths from cholera in Calcutta in two periods of one week each during February and the early days of March. Similarly, a Bill of Health, issued at Rangoon, deals with two deaths during the week ending March 2, 1918. In the Dutch East Indies reports concerning 27 cases and 1 death have been received.

Typhus Fever.

The following information concerning the distribution of typhus fever during the period from January 19 and February 15, 1918, has been culled from the United States Public Health Service reports:—

Place.	Cases.	Deaths.
Union of South Africa	3342	668
Mexico	293	3 (?)
Java	62	10
Egypt	29	9
Russia (probably incomplete)	21	1
China	8	1
Brazil	7	1
Japan	3	5
Great Britain	2	—
Switzerland	2	—
Formosa	1	—
Greece	—	17
Turkey	—	Epidemic.

Two deaths from typhus fever were reported at Baltimore and one case was reported at San Antonio, Texas, in the United States of America, during the week ending January 5, 1918.

We learn that the Victorian Government has made an arrangement with the Board of Management of the Queen Victoria Hospital for Women, whereby a temporary venereal clinic will be instituted at this Hospital, pending the erection of a special institution. There has been considerable delay in the provision of accommodation for females, who are required under the Act to undergo treatment for venereal diseases. This delay was especially deplorable, because one of the main purposes of the legislation was rendered nugatory by it. We understand that the new building will cost about £5,000.

The following have been nominated for election as members of the New South Wales Branch of the British Medical Association:—

Percy Neil Grieve, M.B., 1915 (Univ. Sydney), Kempsey.
 Rudolph Hermann Bohrsman, M.B., Ch.M., 1894 (Univ. Sydney), Glebe.
 Laura Pomeroy Asher-Smith, M.B., Ch.M., 1918 (Univ. Sydney).
 Edward Ventris Bradfield, M.B., Ch.M., 1918 (Univ. Sydney).
 Helen Margaret Inglis Braye, M.B., Ch.M., 1916 (Univ. Sydney).
 Frances Mabel Brett, M.B., Ch.M., 1918 (Univ. Sydney).
 Rowe Clyde Dent, M.B., Ch.M., 1918 (Univ. Sydney).
 Keith Morison Garrett, M.B., Ch.M., 1918 (Univ. Sydney).
 John Hillman Hornbrook, M.B., Ch.M., 1918 (Univ. Sydney).
 John McKee M.B., Ch.M., 1918 (Univ. Sydney).
 Geoffrey Brutus Packham, M.B., Ch.M., 1918 (Univ. Sydney).
 Mona Margaret Ross, M.B., Ch.M., 1917 (Univ. Sydney).
 Lottie Sharfstein, M.B., Ch.M., 1918 (Univ. Sydney).
 Reginald Jaep Wong, M.B., Ch.M., 1918 (Univ. Sydney).
 (All save the first two are at the Royal Prince Alfred Hospital, Sydney.)

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvii.

Herberton District Hospital, Surgeon.
 District Richmond Hospital, North Queensland, Medical Officer.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London. W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other contract practice. Australian Prudential Association Proprietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Brisbane United Friendly Society Institute. Townsville Friendly Societies' Medical Union.

Branch.	APPOINTMENTS.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide. Contract Practice, Appointments at Renmark.
WESTERN AUSTRALIA. (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phoenix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
TASMANIA. (Hon. Sec., Macquarie Street, Hobart.)	Medical Officers in all State-aided Hospitals in Tasmania.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, N.Z.

Diary for the Month.

June 5.—Vic. Branch, B.M.A.
 June 7.—Q Branch, B.M.A.
 June 11.—Tas. Branch, B.M.A., Council and Branch.
 June 11.—N.S.W. Branch, B.M.A., Ethics Committee.
 June 13.—Vic. Branch, B.M.A., Council.
 June 14.—N.S.W. Branch, B.M.A., Extraordinary General Meeting, 9 p.m.
 June 14.—N.S.W. Branch, B.M.A., Clinical.
 June 14.—S. Aust. Branch, B.M.A., Council.
 June 18.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
 June 19.—W. Aust. Branch, B.M.A.
 June 19.—S. Sydney Med. Assoc. (N.S.W.).
 June 21.—Q. Branch B.M.A., Council.
 June 25.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
 June 26.—Vic. Branch, B.M.A., Council.
 June 28.—N.S.W. Branch, B.M.A.

EDITORIAL NOTICES.

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